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Volume 55 Number 11

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IN THIS ISSUE

A.V.M.A. CONVENTION HIGHLIGHTS
EQUINE PRACTICE
HOW I HANDLE FEEDLOT ARRIVALS
ECTOPIC URETER IN THE DOG
PSEUDOMONAS INFECTION IN MINK

Complete Index on Page 5

# Let's take the bull by the horns

Did you ever try to outrun a bull? Most of us hav —at one time or another. And while the chase is fur , the consequences are bad if we don't succeed.

Right now, figuratively speaking, a bull is after a ot o us. The trend in recent years has been for an incr asin number of suppliers of veterinary products to sell direct to laymen. If this trend continues, could it ot be rough on veterinarians, ethical supply houses a d— ultimately—on the whole livestock industry?

Like we said, the bull's getting closer—almost brea thin down our neck. *Maybe it's time to stop running.* Realizing our dependence on each other, we are taking a stand. We hope to grab the bull by the horn and hold him long enough for you, the graduate veterinarian, to see him for what he really is.

We think you'll know what to do, so we'll only drop a hint: Why not send your next order to one of the companies who own and operate Affiliated or to some other ethical supply house—rather than buy from a supplier who feeds the bull?

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*Veterinary Medicine* *Volume 55* *Number 11* *October 1960*

## *GENERAL FEATURES*

31 How I Handle Feedlot Arrivals

35 The Riddle of Udder Edema, W. R. McCuistion

41 Field Report: Therapeutic Management of Urinary Calculi in Cattle, R. A. Baldwin

71 Mississippi Tests on a New Anthelmintic in Sheep, R. A. Knight, J. A. McGuire, L. Walton

75 Cystic Pituitary Glands in Cattle, J. M. Delphia, F. M. Bolin, D. F. Eveleth, M. L. Buchanan

78 Evaluation of Water Soluable Nitrofurans in Experimental Salmonella Infection in Turkey Poults, B. W. Bierer, C. L. Vickers

## *SMALL ANIMAL PRACTICE*

45 A "Quick" and "Clean" Method of Evaluating Canine Distemper Products, V. Marshall, R. W. Bailey

48 Ectopic Ureter: A Report of Two Cases, A. J. Cawley, J. Archibald

55 Pseudonomas Infection in Mink, W. H. Beckenhauer

58 Ringworm Therapy in the Cat, L. M. Tarr

65 Unconventional Aspects of Canine and Feline Sexuality, A. Barton

## *REGULAR FEATURES*

9 News Comment

23 Equine Practice

38 General Practice Topics

52 Small Animal Clinic

89 Reader's Service

## *SPECIAL FEATURES*

17 A.V.M.A. Convention Highlights

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# News Comment

**Oxygen in Lungs**

Observations by Dr. Jay Jacoby, Marquette University School of Medicine, show that pumping oxygen into the lungs of dogs can raise blood pressure, increase the oxygen content of blood, and restart the heart in cardiac arrest. Pressure on the heart and large vessels from the inflated lungs apparently is responsible.

**Protein Content in Milk**

Workers at the All-Union Institute of Cattle Breeding, Russia, have perfected the use of fluorescence for quickly determining the protein content of milk. The luminescence of proteins under ultraviolet light can't be seen by the human eye, but a uranic glass in a special instrument transforms the ultraviolet fluorescence into visible light that is measured by an electronic eye. The protein in a sample of milk diluted 20 times can be determined to within 0.1%.

**Investigation of Welch**

Health Secretary Flemming has two committees investigating the past activities of former Antibiotic Division Chief Henry Welch. Dr. Welch resigned when it was revealed that his extra-curricular activities for private publications netted him around $285,000. Drug legislation introduced by Senator Kefauver has support of F.D.A. and will be in the spotlight next session. The bill would allow F.D.A. to license and inspect all producers and sellers of prescription drugs, and adds testing for efficacy to new drug testing.

**Spread of Face Fly**

The face fly sneaked into this country last summer from overseas and spread rapidly east to midwest. This year it is reported as far south as North Carolina. Control has been a real problem. The USDA has recently approved use of DDVP in a mixture of 75% corn syrup and 25% water to brush on a cow's face and kill the flies that cluster around the eyes. The material is applied with a small paint brush making a single six-inch stroke down the middle of the forehead.

**Glycerolized Frozen Blood**

More than 1,000 pints of glycerolized frozen blood have now been administered at the U.S. Naval Hospital, Chelsea, Mass. and New England Deaconess Hospital, Boston. The blood has proved suitable for replacement during vascular operations and extracorporeal circulation and general surgical procedures. Reaction rate has been 0.4%, about one-tenth that occurring after conventional transfusions. Despite long storage, usually two years at -80° C., no blood abnormalities have been noted; some units have been used with impunity after forty months' storage. An average 82% yield of the original donor's blood has been transfused after the storage period.

**Clearance of Insecticide**

Clearance of a new grub killer as a feed additive by F.D.A. adds another potential toxicity the veterinary practitioner will have to keep in mind when dealing with unusual diagnostic problems in cattle. The systemic insecticide, Ronnel, has been approved in beef cattle feeds to kill cattle grubs. This is the product developed by Dow Chemical Co. and known originally as ET-57 in the bolus form. Clearance was granted for feed use to Moorman Mfg. Co. A zero tolerance was set for the drug in edible meat of animals treated, and levels of 2,750 parts per million are allowed in the feed. Dow has a petition pending which would permit 6,000 p.p.m. in feeds. The finished medicated feed label must bear the name of the chemical, along with directions to be used only for control of cattle grubs; not to be fed to dairy cows; not to be fed within 60 days of slaughter; to be fed for 14 days, and to be used for beef cattle only.

## Editorial:

# The Shifting Veterinary Supply Picture

The morning headline, "Dow Chemical Company Announces Pending Merger With Allied Laboratories" did not cause me to spill my coffee but the realization did slowly permeate my early morning semiconsciousness that this possibly marked the final chapter of the independant veterinary supply houses. The import of this announcement and other recent developments in the veterinary drug field tumbled through my mind. What does this mean? Is it good or bad for the profession? What is the real story?

A look at the case history shows that these houses were developed to fill an important need. An infant profession neeeded sources of drugs and biologicals which existing human houses did not have. These firms outdid themselves in specialized services for the veterinarian.

Many veterinarians in practice today owe their start to the financial credit and encouragement extended by such firms in the early lean years.

Coinciding roughly with the development of sulfonamides, the nations pharmaceutical industry leaped forward, and created drug surpluses that screamed for new markets. The livestock industry and the veterinarian received increasing attention.

The facts are all too obvious. The sales potential of a small profession just wasn't great enough to support the research and production methods required for veterinary houses to long remain competitive. Outside financing had to be obtained. While most firms turned to larger firms with common interests in the drug field, some solved the problem by pooling their efforts with similar firms.

Practicing veterinarians have had their fling at the problem with controversial, coopertive organizations formed to supply their own needs. Recently announced reorganization plans of Diamond Laboratories appear to place this organization in the same general competitive race as other firms now.

For the future, it would appear that the veterinarian will be offered an increasing array of new products. This competition should definitely favor the practicing veterinarian.

Does this mean that restricted sale of products will soon be out the window? I personally doubt it. It just wouldn't make good business sense to invest large sums of money in firms known only to a small profession with the intention of diverting sales to farm and feed industry channels. I believe we can accept the fact that the pharmaceutical industry recognizes the professional veterinary drug market as a distinct part of the economy with a potential for future growth.

We have just closed the book on one phase of veterinary history and are opening a brand new one. Many will shed a tear at the loss of close personal ties and specialized service which will certainly diminish.

On the other hand we can count on an ever increasing supply of the best veterinary drugs in the world and recognition of veterinary medicine as a mature profession with a future. Business investors have never been known to bet on a lame horse.

*C. M. Cooper, D.V.M.*

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1. Anderson, F. B.: Vet. Med. *54*:535, 1959.
2. Lawson, K. F., *et al.*: Canad. J. Comp. Med. *22*:164, 1958.

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# A.V.M.A. Convention Highlights

*Dr. E. E. Leasure, President of the American Veterinary Medical Association for the coming year.*

The 97th Annual Convention of the American Veterinary Medical Association in Denver August 14-18, again broke all-time attendance records with registrations around the 5400 mark. The spacious facilities of Denver's auditorium were utilized to fullest advantage as veterinarians from all over the world got together in their chosen speciality sessions.

Denver's new Hilton Hotel served as headquarters deluxe for numerous alumni and special meetings. Excellent attendance at the technical sessions was a tribute to the quality of programming as veterinarians resisted the temptations of Colorado's recreational facilities to attend the professional meetings. While wives and families enjoyed the gracious western hospitality and mountain scenery, veterinarians soaked up new knowledge and gained inspiration from this practice-oriented program.

A touch of political excitement flavored the convention atmosphere as the attending members elected Dr. Mark Morris president-elect in a hotly contested and close election.

Dr. Morris brings to the A.V.M.A. an unusual background of practice, nutrition and research. As a practitioner, he has more than a quarter century of experience in both large and small animal work. As a nutritionist, he is internationally known. As a research man, he started a Foundation

*Dr. Mark L. Morris, president-elect of the American Veterinary Medical Association.*

*Dr. H. H. Dukes, winner of the 1960 Borden Award.*

which has supported the education of 29 young veterinarians at 16 schools.

His interest in research led to the establishment of research laboratories at Topeka, Kansas, where more than 50 different studies are currently under way in swine, sheep, canine and feline health. A tireless worker in the interests of organized veterinary medicine, Dr. Morris brings to the association assurance of vigorous, progressive and experienced leadership in tune with the changing role of the profession.

Dr. E. E. Leasure, dean of the School of Veterinary Medicine, Kansas State University, in assuming his role as president of the A.V.M.A. for the coming year revealed a keen awareness of the problems and trends of veterinary medicine as they exist today. As he pinpointed the shifting role of the veterinarian in connection with the trend toward greater concentration of livestock and shifting population, his understanding of the increasing opportunities for veterinarians and the "tooling up" needed to meet these new opportunities, instilled confidence in attending members. With the problem defined and needs recognized, the 97th Convention of the A.V.M.A. presented a public image of a dedicated profession eager to get on with its increasingly important work.

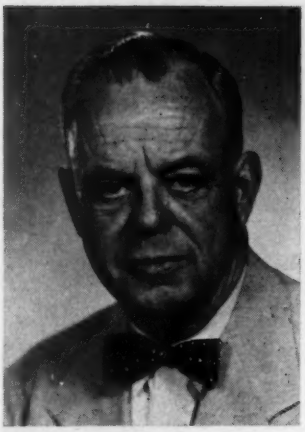
Five veterinarians received honors at the official opening of the 97th annual meeting of the American Veterinary Medical Association.

Drs. H. H. Dukes, Ithaca, N. Y.; W. A. Hagan, Ames, Iowa; C. E. De Camp, Scarsdale, N. Y.; Glyndon T. Easley, Sulphur, Okla.; and Dr. David K. Detweiler, Philadelphia, Pa. were the veterinarians honored.

## Borden Award

Dr. H. H. Dukes, recently retired as professor and head, Department of Physiology, New York State Veterinary College, Cornell University, was named winner of the 1960 Borden Award for his outstanding contributions to dairy cattle disease control.

His major contributions included basic studies on the digestion process of ruminant



*Dr. W. A. Hagan, awarded the 12th International Veterinary Congress Prize.*

*Dr. C. E. DeCamp, recipient of the 1960 American Veterinary Medical Association Award.*

animals which served as a starting point for other scientists working on specific disease conditions of cattle.

## 12th International Veterinary Congress Prize

Dr. W. A. Hagan, past dean of the New York State Veterinary College, Ithaca, past president of the American Veterinary Medical Association, and director of the U. S. Department of Agriculture's new National Animal Disease Laboratory, Ames, Iowa, received the 12th International Veterinary Congress Prize.

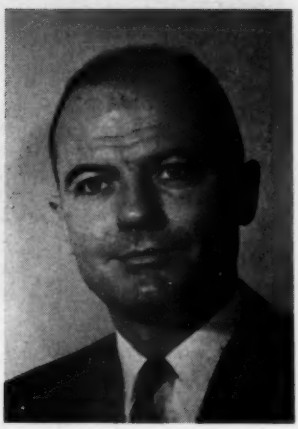
Given to an individual for advancing world veterinary medicine, the award cited Dr. Hagan's activities as a consultant to the U. S. Control Council rehabilitating veterinary schools in Germany following World War II. Dr. Hagan is an honorary member of the veterinary organizations in Great Britain, France, Sweden, and Greece. In 1953 he was official United States delegate to the 15th International Veterinary Congress in Stockholm, Sweden, and was chairman of the United States delegation to the 16th International Veterinary Congress in Madrid, Spain last year. At that meeting, he was elected vice-president of the World Veterinary Association. In 1958, he also served as chairman of a United States delegation of six veterinarians visiting the Soviet Union.

## American Veterinary Medical Association Award

Dr. C. E. De Camp, Scarsdale, N. Y., was named winner of the 1960 American Veterinary Medical Association Award for his many contributions to organized veterinary medicine. During the past two years, Dr. De Camp has directed the development and formation of the Interprofessional Society of New York State combining the medical, dental, and veterinary medical associations for exchange of scientific information.

He is also Chairman of the Pet Committee of the Person-to-Person International Program. For a ten-year period he also served as the representative for the National Dog Welfare Guild and National Dog Week.

*Dr. Glyndon T. Easley, winner of the 1960 Practitioner Research Award.*



*Dr. David Detweiler, recipient of the 1960 Gaines Award.*

## Practitioner Research Award

The AVMA Council on Research selected Dr. Glyndon T. Easley, Sulphur, Okla., to receive the 1960 Practitioner Research Award.

Dr. Easley is staff veterinarian at the Turner Ranch, Sulphur, and during his 14 years of service has kept a complete record on every animal including treatment, breeding, calving, and similar data. These records have provided the profession with valuable experimental data useful to veterinarians working with beef cattle under range conditions.

Of particular value, the Council said, was Dr. Easley's recent work with Armed Forces Institute of Pathology and the cancer research group at the School of Medicine, Houston, Tex., on cancer of the eye in a breed of beef cattle.

## 1960 Gaines Award

The Gaines Research Center director, Mr. Harry Miller, New York City, presented the 1960 Gaines Award to Dr. David Detweiler, Philadelphia, Pa., for his recent contributions to comparative studies of heart disease in a variety of species of animals.

Dr. Detweiler was specifically cited for initiating the first survey of a dog population in a given area to determine the incidence of heart disease in dogs.

## 1960 AVMA Science Youth Award

Mr. Robert D. Towe, 17, Bozeman, Mont., a high school youth, exhibited his project on "Experimental Urolithiasis" to the 4,000 veterinarians, members, and guests attending the national veterinary meeting. Towe received the second annual AVMA Science Youth Award at the National Science Fair-International in Indianapolis last May.

# Equine Practice

*The sudden resurgence of horse practice has created renewed practitioner interest. This series of condensed reviews will cover fundamental technics of equine practice. These reviews will be supplimented by periodic articles by experienced equine practitioners. Watch for an original research study on Arthrocentesis of the Equine Carpus in the November issue.*

## Dental Surgery

*Trephining and repulsion:* Anesthesia can be accomplished with 2% procaine hydrochloride solution using a four inch, 18 gauge needle. Mark a place in the middle of the orbit and move one inch below that point. The needle is pushed forward and upward, sliding along the maxillary tuberosity. Introduce the needle two inches and move away from the bone, injecting 10 cc. of the anesthetic solution.

The skin must be anesthetized locally. Draw a line from the canthus of the eye to the infraorbital foramen and don't go above this line. The incision is made near the posterior border of the tooth. Remove the skin down to the bone. The bone is chiseled and punched out. It is necessary to go through the frontal sinus to reach the 6th cheek tooth. Use of an offset chisel is valuable. Teeth tend to shatter in old and young animals. It is essential to curette the alveolus carefully.

In the lower mandible it is possible to anesthetize the first five teeth satisfactorily. Just cut out a square of bone and inject anesthetic solution at the base of the tooth. A narrow punch is helpful.

The back tooth is always a problem. To avoid the salivary duct and vessels near the fourth and fifth tooth, use a neurectomy hook.

*Aftercare:* Pack the alveolus with medicated gauze and leave it for three days. An old standard medication for this purpose was Bipp solution but recent therapy tends toward the use of neomycin or some stable antibacterial chemical. On removal of the pack, examination may indicate that it be allowed to go another five days. When good granulation has been obtained, pack the opening with dental impression wax to prevent fistula formation. Place the wax in warm water before packing.

Extraction of incisor teeth is readily accomplished by chiseling a V-shaped piece of bone at the base of the tooth before attempting to chisel out the tooth. Whenever a tooth is removed, it is sound practice to cut off the opposite tooth.

*(continued on page 24)*

## Growths Around Incisors

*Etiology:* A true tumor is present in 50% of these cases. Osteitis is also observed due to inflammation. In older animals these growths are more apt to be malignant.

*Prognosis:* Guarded.

*Treatment:* Remove growths. They chisel off readily and should be followed with curettement. Hemorrhage is extensive but arrests spontaneously. The mouth should be flushed with an astringent such as potassium permanganate solution.

## Wounds of the Ala (Wing of Nostril)

Alar cartilage aids support. There is a collapse if the cartilage is removed or in some cases of facial paralysis. The horse can't breath freely when the nostril is collapsed.
*Etiology:* Trauma-nails, hooks, wire, dog bites.
*Signs:* Wound in wing of the nostril, with little hemorrhage.
*Prognosis:* Guarded, more favorable if only the skin injured.
*Treatment:* Clean the wound. Trim the wound edges and suture with silk. *Do not suture the cartilage.* It may be necessary to suture inside and outside the nostril. It is essential to tie the animal so he can't scratch. An anesthetic ointment is useful. Fistula formation and hyperplasia are common complications. To avoid fistula formation, open and curette the wound.

## Fracture of Nasal Bones

*Etiology:* Trauma. This condition is not common.
*Signs:* Swelling and deformity. Hemorrhage is a problem with a compound fracture. Swelling may cause dyspnea.
*Prognosis:* Guarded unless it is a simple fracture.
*Treatment:* Insert a tracheal tube and pack the region to halt hemorrhage. Attempt to replace the part in normal position. *Don't make a simple fracture into a compound fracture.* Tie the animal to prevent rubbing, remove splinters, supply drainage and curette.

## Foreign Bodies in the Nasal Passage

*Etiology:* Rare in horse unless done intentionally.
*Signs:* Not readily observed. Possibly a mucopurulent discharge or animal may rub the nose. Observe the air stream from the nostril, pass a stomach tube or use a flashlight for examination.
*Prognosis:* Depends on the extent of damage.
*Treatment:* Remove the obstruction and use a warm irrigant.

## Tumors of the Nasal Passage

*Signs:* Common in the horse. A nasal discharge is readily observed.
*Prognosis:* Guarded. Depends on the kind of tumor present. They are apt to be malignant (fibroma or carcinoma). Polyps are also seen. They are pedunculated and contain fluid. They are derived from mucous membrane.
*Treatment:* Remove, using a loop of wire through a small pipe. It may be necessary to trephine the nasal cavity. Irrigate and spray the nostril with adrenaline 1:1,000 before attempting surgery.

## Dropsy of the Sinus

*Etiology:* Always occurs in young horses. It is probably an anomaly.
*Signs:* Usually involves the frontal sinus with bulging of bones either unilaterally or bilaterally. The whole face often becomes deformed. Trephining and careful examination will reveal no inflammation. It is a cavity with some serous fluid. There is no nasal discharge.
*Prognosis:* Unfavorable.
*Treatment:* Might try draining but there is no practical treatment.

*(Continued on page 26)*

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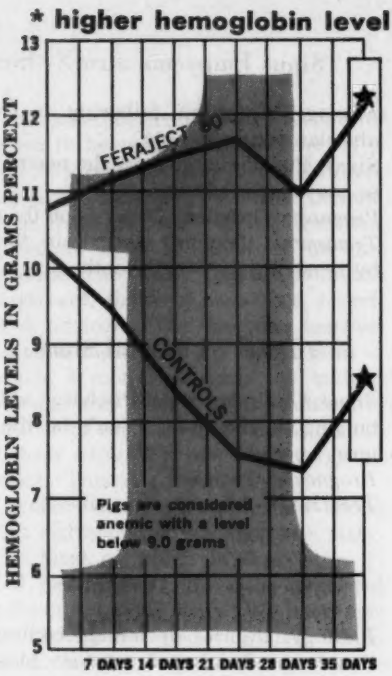
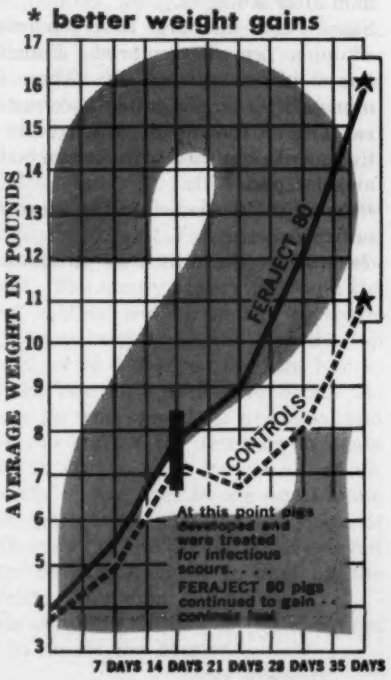


## Sinus Empyema

*Etiology:* Infection following a fracture, alveolar periostitis, etc.
*Signs:* Pus discharge from the nostril. Little or very little bulging.
*Prognosis:* Guarded. Depends on the causes.
*Treatment:* Trephine and drain the sinus by removing the fourth tooth.

## Tumors of Frontal Sinus

*Signs:* Unilateral nasal discharge with mild bulging of the sinus. Can't be diagnosed until opened.
*Prognosis:* Guarded.
*Treatment:* Attempt removal.

## Necrosis Of Turbinates

*Etiology:* Injuries by foreign bodies, infection from adjoining structures. Most common after strangles.
*Signs:* Nasal discharge is very purulent and contains necrotic material. Usually unilateral but not necessarily. There is a diminished air stream, often accompanied by swelling of the mandibular lymph glands. Commonly confused with foreign bodies and alveolar periostitis.
*Prognosis:* Guarded — will last forever without treatment.
*Treatment:* Remove the turbinate bones with an obstetrical chisel. This is a difficult procedure and is reserved for valuable animals. Spray nasal passage with adrenaline and use general anesthesia. Keep a trachea tube handy as hemorrhage is often severe. Work fast and then control the hemorrhage by packing tightly.

Operate with head down so blood can drain out, and be ready with a blood transfusion. Packs can be removed in 48 hours but pneumonia is a complication to be guarded against. Occasionally, septicemia will occur.
*Prognosis:* About 50% recover. May recur if all necrotic tissue not removed.

## Epistaxis

*Signs:* From stomach — bilateral, coffee-colored clots, mixed with food particles. From the nasal cavity it is usually a unilateral bleeding, frequently bright red and flows freely but does not spurt. There is no froth or food particles.
*Etiology:* Spontaneous, severe exercise, vessel fragility, varicose-like vessels, injury or ulceration of the mucosa.
*Prognosis:* Favorable when due to trauma.
*Treatment:* Cold applications applied to the head. Never irrigate. Elevate the head if possible. Blood clotting agents may be given or if bleeding is prolonged, blood transfusion may be required. Horse serum has been used for race horses. Packs are not successful.

## Report From Dr. Schofield—Korea

*EDITOR'S NOTE: As a result of two earlier reports about the work of Dr. Frank Schofield in Korea, V.M. readers have forwarded $700.00 to further his projects. In a letter dated August 3, he expressed his deepest appreciation to the members of his profession that have come to his aid and included the following news report.*

My dear friends,

I know that you have been neglected the last few months, but the Student Revolution in April resulted in many demands on time and energy. One could not say "NO," in such a critical situation.

The outcome is unpredictable — political corruption has gone, for some time, but other forms of corruption remain along with a host of other problems . . . thousands of unemployed, the general poverty — millions of farmers who eke out a bare existance, the enormous army consuming 65% of the budget, and at the 38th parallel the Communist army waiting for the opportunity to invade.

The Students have inaugurated THE NEW LIFE MOVEMENT. The two most important aspects of which are (a) The Enlightenment Campaign carried out by teams of students, visiting most parts of the country and informing the farmers on such matters as: democracy, election law, the functions of the National Assembly, Senate, etc. (b) The Austerity Campaign, active chiefly in the city of Seoul, where amidst great poverty, there is far too much luxury among the 1% or 2% who have been selfish enough, and usually crooked enough, to make fortunes.

The Business and Vocational School is an inspiring adventure of faith. It was started by fourteen university students, mostly Christians, in the poorest part of Seoul for the education of children who were too poor to go to school. The school is an old wooden building previously used for rice storage. No desks, no seats, some mats on the floor. Now there are 600 children, with day and night school, and staff of thirty student teachers working in shifts. To the children I am Grand-father and it is a wonderful experience to be nearly toppled over by a crowd of very poor yet very happy children, greeting Grandfather with boistrous delight. Of course, there are prizes of chocolate bars, water mellon, eggs or tomatoes, at quiz programmes. The teachers expect unlimited encouragement, financial assistance, friendship and advice. (The fourteen teachers who founded the school pay 1000 Hwan = $1.00 each, a month, towards the budget. That means real sacrifice, in addition to the sacrifice of time. I am proud of them!) But it costs $150.00 a month to carry on the school. This is a big problem.

The orphans in our two orphanages—Bong Un, with eighty-one and Mapo, with sixty-one, the head of which is dear little 81 year old Euh Pueen, have been neglected not in finance, but in visits. We have now a total of five adopted orphans. Mapo Orphange has been visited twice during the last two months, along with Korean Christian students who had collected clothes. The students gave short talks and sang. The orphans responded by singing the hymns which they had learned as loudly as possible. Already there are many rabbits, and more food from the land which we purchased last year.

With some of the money ($50.00) given me by the readers of Veterinary Medicine we were able to send a little boy of thirteen to school. The family is very poor and the widowed mother had no money to spare. He is a very bright boy and was the top in the school of 600 boys. We sent him to one of the best boys schools in Seoul. At mid-term he was second in his class, and now at the end of the term he is again second. It was a great joy to all of us. The family of five lives in one small room.

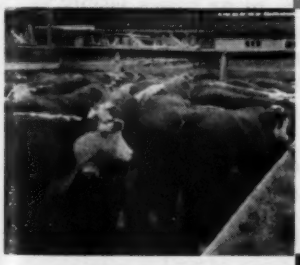
Much more to tell you, but not space or time. Terribly hot and humid, but if it is not good for the foreigners, it is good for the rice which is far more important.

Please continue to pray for what we are trying to do for the Master.

Most sincerely,
*Frank W. Schofield*

# *New, effective treatment for impaired fertility in cows*

# How I Handle Feedlot Arrivals In My Practice



*The views of three busy practitioners from three different states are presented. How are you handlng feedlot arrivals this year?*

*Guy Flater, D.V.M.*
*Galesburg, Illinois*

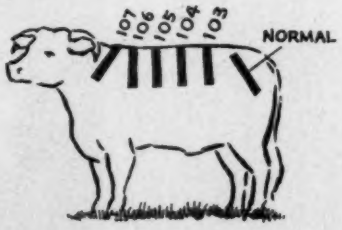
It's a little difficult to report how we handle recently shipped in feedlot cattle in that if we had total supervision from the day they arrived, we would handle them differently. Unfortunately, we're not called until the farmer either has some sick ones —or worse yet, some dead ones.

First, I'll describe how we advise handling these calves. The ideal situation would be to have the calves vaccinated against Lepto and Red Nose two weeks before they are shipped, but since this does not seem to be practiced, we recommend that they be vaccinated against these two diseases as soon as possible. We formerly advised shipping fever serum but have discarded it as being of very little use. We feel that the experience of veterinarians in the large feed lots in Colorado certainly has application here in Illinois. They feel that they have cut down the incidence of shipping fever through vaccination for Red Nose.

The only other routine medication we use is to put these calves on sodium sulfathiazole in the drinking water. We mix 1 lb. of sodium sulfathiazole to one gallon of water, add one box of black raspberry jello to mask the flavor and color the mixture. We mix the gallon of sulfathiazole in 200 gallons of drinking water. We feel, on the average, that a 400 to 500 pound calf will drink about five gallons of water a day, and that will provide an intake of 200 grains of sulfathiazole. We keep them on this dosage for five days. As to feed, we recommend whole oats and a medium to good quality hay. Free access to salt and even adding a little salt to the oats will help in the consumption of the medicated drinking water. We like to see these calves put either in a clean lot or a small pasture with access to a well ventilated barn. If the farmer has them in a small area and has them coming to the bunk to eat twice a day, he's going to be able to pick out his sick calves much sooner.

If the farmer has had the calves for awhile and some of them are already sick, we naturally pick out the sick ones and treat them. We have tried practically all of the new antibiotics, sulfas, etc. but we still go back to the treatment that we have used for several years. That treatment is quite simple — PMT (Pitman-Moore), I.P. and Combiotic (Pfizer & Co.). We use 200 cc. PMT on a 400 lb. calf and 10 cc. Combiotic. If there are very many calves visibly sick, we again use our sulfathiazole herd treatment for five days. If we are dealing with a severe outbreak of shipping fever, we will temperature each calf and treat all of those with a fever of 103 degrees or more.

We mark these calves with yellow chalk in the following fashion:



In this manner, we are able to tell fairly accurately what the animal's temperature was the preceding day. We retreat these animals until their temperatures are normal and there is visible improvement. Occasionally, this is a long and arduous task, but the results have been most gratifying. The owner has quite an economic investment and shipping fever can be acute. If they do not respond to the above treatment, then we will change to tetracycline and Liquamycin (Pfizer & Co.).

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*Richard F. Bristol, D.V.M.*
*Montfort, Wisconsin*

Most of the animals in this area are shipped in from Montana, Nebraska and the Dakotas. The time lag between shipping and receiving is four to seven days. We have always felt that strict attention to management details is the most important factor in handling shipped animals. For that reason we instruct the owner to follow the following points:

Animals should have access to good quality grass, hay and fresh, clean water at all times after arrival. We feel that legume hay is not as desirable as good grass or timothy hay. It seems to cause a mild enteritis when first fed to animals that are more accustomed to pasture grass and prairie hay.

Keep the animals as quiet as possible. We try to complete our preventive vaccinations, cursory examinations and treatment, if needed, in only one handling. Thereafter, we disturb the animals as little as possible other than a walk through the yards once or twice a day for the first week to check for sick animals.

Isolate sick animals from those who are well. This is a simple and rather old fashioned medical procedure; however, it enables us to keep track of the sick animals and have them in a separate place for continued treatment.

We request that the owner have a good chute or pen in which to restrain sick animals for examination and treatment. The procedure of roping and chasing already sick animals is far more harmful than anything you can do. They should be handled quietly with gates and a chute and a minimum of noise. You cannot make a proper diagnosis and evaluation if the animal is panting from being chased, tired from a five day ride and excited by the yells of the men trying to catch him.

## Preventive Vaccinations Given Upon Arrival

1. Each animal is give 10 cc. of *hemorrhagic septicemia* bacterin and *infectious bovine rhinotracheitis* vaccine.

2. Those animals which are under 18 months old are also give *clostridium chauvei septicus* bacterin.

3. We have not, as yet, experienced or diagnosed leptospirosis in our feedlots in this area, so this vaccine is not given, but we anticipate having to do so in the near future.

4. Heifers are aborted with 100 mg. of diethylstilbestrol if they are less than six months pregnant. We have found this procedure and dosage to be about 80% effective.

We do not use drinking water medications of sulfonamides, tranquilizers, broad spectrum antibiotics or arsenicals. We have tried some and do not feel the benefits derived can offset the cost of the drugs. Cool,

## How I Handle Feedlot Arrivals

*(continued from page 33)*

clear, clean water remains the best form of liquid for an animal to drink.

### Treatment of Sick Animals Upon Arrival

Our treatment of sick animals is based on combating infection, reducing temperature, and correcting dehydration if any exists. We try to effect a well animal at the least cost to the owner. Any animal whose temperature is over 105 degrees F. is treated in the following manner:

1. 1½ gr./lb. of body weight of sufathiazole, sulfamerazine, sulfamethazine mixture intravenously.

2. 2½ gm. of streptomycin for each animal under 500 lbs. and 5 gm. for each animal over that weight is administered intramuscularly.

3. 1 gr./lb. of the sulfonamide is given in a divided dose for two days following initial treatment.

4. 500 to 1,000 cc. of a 10% glucose solution with added B complex is given to combat dehydration and fatigue.

For those cases that fail to respond to the above treatment the following drugs have been used: Antihistamines, oxygen administered intranasally, neomycin parenteral, chlortetracycline, chloromycetin.

Infectious keratitis, lacerations and maggot infestations are treated as the animals go through the chute for the first time.

### Summary

All of the so-called wonder drugs cannot replace the effects of good management procedures on the newly arrived animal. Therapeutics are only an adjunct to proper nursing care. Proper bedding, gentle handling, feed, clean water, continuous observation and prompt treatment are all important in a successful feedlot program.

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*Jack Cady, D.V.M.*
*Arlington, Nebraska*

We have several types of feeders in our practice. One group are the feeders that like to feed big aged cattle — the majority of these boys are strictly gamblers, so they would rather lose a few than call the veterinarian until it is too late. These feeders have fed cattle the same way for many many years and nobody can give them any advice. They will take no advice on how to start new cattle.

Now, the next group of feeders are those who feed calves and yearlings in their feedlots. These boys want to do what is right and best for their livestock. Here are a few things we list for them to consider: Don't overcrowd or put cattle in sheds where they will get too warm. Give cattle plenty of good clean fresh water — easily accessible to all. Try to start cattle on wild hay the first two days; the next week, give them a little oats — one or two lbs. apiece at the most; gradually change them over to silage or alfalfa with the wild hay mixed for three days. Be sure not to heat up cattle or get them exhausted. Let them have plenty of rest for five or six days before moving them any distance.

We suggest that the cattle be vaccinated for Infectious Bovine Rhinotracheitis between two and three weeks after coming to the feedlots. In several lots we also have had to start vaccinating for leptospirosis where the disease has been, or when very close to infected lots.

We give the heifers a shot to produce abortion about ten days after the Red Nose vaccine has been given.

It is important to get this point over to your client: take plenty of time to get these animals up on full feed. If you take four weeks instead of ten days to get the cattle on full feed, they will eat more pounds per day and stay with this higher ration without any trouble — besides putting on more pounds at the end of the feeding period.

# The Riddle of Udder Edema

W. R. McCUISTION, D.V.M.
Ft. Worth, Texas

Udder edema seems to be a very useful and effective emergency mechanism for preserving the patency of the underdeveloped and tender circulatory vessels of the mammary glands. Consequently, this type of non-inflammatory edema occurs more commonly among primigravida than in multigravida dairy animals.

The appearance of udder edema in a dairy animal is usually considered a good sign of a potentially high milk producer, but not all of the high producers of milk manifest the symptoms of udder edema. This may be due to the fact that they are not all equally subjected to the same degree of stress during their initial pregnancy and while in preparation for this particular period of lactation.

Dairy goats also have this non-inflammatory type of edema, but it is not so prominent among them as it is in dairy cows. The design of their two-teat udder and the natural agility of dairy goats may be important factors in preventing stress during the last weeks of pregnancy in the mammary region, at least when this is compared with their much larger cow cousins. Close confinement to small stalls during pregnancy of dairy goats appears to have some influence on bringing this udder edema mechanism into action, but rarely is there any stocking of the legs.

## False Pregnancy

Dogs, cats and domestic rabbits will develop symptoms of udder edema under certain circumstances but none of these species are bred for high yield milk production. In the canine the condition is known as false pregnancy or pseudocyesis, in which the internal reproductive organs as well as the breasts may both become involved.

Veterinarians who make it a practice to spay bitches regardless of whether these are in or out of estrus are in a position to witness and correlate the different stages of this edematous process, which otherwise might go unnoticed and possibly unreported. Unspayed pet dogs that are never permitted to mate and reproduce young are the most frequently affected with pseudocyesis, usually about 60 to 70 days following their estrus.

Those dogs which are allowed to suckle their young in the normal manner, like dairy animals which have gone into full milk production, pass from the juvenile mammary stage of development to that of full maturity, and it is unlikely these subjects will show edema other than during their initial pregnancy, if at all.

We recently performed a panhysterectomy upon a ten-year-old Boston terrier that never before had been mated and was

Photo courtesy of American Cyanamid

*Udder edema commonly extends well forward on the bovine underline.*

unable to deliver her puppies. Her case history indicated pseudocyesis had been associated with each preceding estrum throughout her life, which she was showing and continued to show after surgery. This suggested to us, that while she had attained a ripe old age, her mammary development was still immature and quite incomplete.

Unspayed pet female dogs which go unbred and develop edema of their breasts sometimes terminate in the clandestine habit of licking the mammary glands, which brings on milk production that is difficult to stop. In these cases the edema may cease to function, more like that of a matron that has suckled her puppies.

## Caprine Autopsy Findings

A post-mortem examination was conducted upon a dairy goat heavy with pregnancy and showing considerable udder and underbelly edema, where the primary cause of death was due to a broken neck, but fortunately, this case enabled us to learn something new about non-inflammatory edema of this kind by taking the time for carefully tracing the congested network of lymphatic channels as these enveloped the subcutaneous abdominal veins along their course to the milk wells. The picture presented a remarkable likeness to erectile tissue structure surrounding the urethra in the corpus cavernosum urethrae. Speaking as a clinician, this device appeared to be the same principle used by nature in maintaining the patency of the urethral canal for the passage of semen and the other reproductive secretions in overcoming the pressure encountered in the surrounding structures. On one hand, the blood was the medium, and on the other hand, lymph served as the medium for the preservation of patency. When one recalls the laws of physics relating to the pressure in fluids and fluids in motion, the dynamics will begin to be revealed. We should remember the thin-walled veins and capillaries in the abdominal and udder region are subject to considerably more pressure during the latter weeks of the first pregnancy than at other times.

## Hormone Effects

The hormone, relaxin, is thought to be influential in stretching of the virgin uterus throughout pregnancy, decalcification of the pelvic symphysis, relaxing the ligaments and other soft structures of the birth canal, each precisely timed and in accordance with its relative abundance and the needs of the maternal body.

Would it then be illogical to presume that relaxin extends its action even further to aid the developing mammary glands and their tributaries, since these also are an integral part of the process of reproduction? The soft edematous texture and consistency of the skin surrounding the vulva and perineum when relaxin is active bears a striking similarity to that observed in edematous udder and the large under-belly ridges extending forward along the lower abdominal wall. Cause for even more far-reaching effects of relaxin has occurred to the writer when it was observed that separation of the mandibular symphysis seems to appear more often during the later stage of caprine pregnancy, precipitated possibly through the butting propensity of these animals, and their disturbed calcium metabolism at this period of time.

The weight of the rapidly growing fetus increasing the intra-abdominal pressure during latter pregnancy against the inelasticity of the tightly drawn skin may alter critically the normal flow of venous blood through the tender under-belly veins, unless their patency is adequately maintained through the foamex-like rubber cushioning provided in this region by the lymphatic system.

## Another Trouble Spot

When the skin has reached its maximum stretching capacity in the abdominal region, there is a vital area near the medial line just anterior to the udder where its attachment is secured very tightly to the abdominal muscles and fascia. This is the first place to manifest extreme tension through the formation of a dry gangrenous scab. The scab is the result of an ischemia which is, of course, nearly always associated with the formation of dry gangrene, and as separation takes place around the margin between it and the healthy tissue, a seepage exudes which attracts flies. Many dairymen have the idea flies are responsible for this gangrenous area, which is incorrect.

This is the kind of tension that obstructs the circulation of blood in the tissues, a situation which local edema prevents. When the under-belly edema forms, the small veins and capillaries of the region are relieved of pressure and as the blood courses through them again, the gangrenous ulceration immediately begins to heal.

## Foam Rubber Suspensory

The Mexicans are very fond of milk goats and have been quick to recognize the early signs of gangrene in this area and have used sponges sewn together for suspensories to fit their goat udders and abdomens. Foam rubber serves even better and will prevent gangrenous scab formation and reduce extensive edema. The judicious adjustment of a suspensory will also reduce undue tension on the young and underdeveloped suspensory ligament of the udder. Little do we realize the requirements of the vast network of tortuous tubular vessels hidden within the udder which convey the blood, the lymph and the milk, each within their respective channels.

The virgin uterus and udder never return to their original size. Relaxin and pressure aid in bringing these organs into their maturity and when this has once been attained, this hormone is diminished and only sufficient quantity is produced to dilate the bony pelvis and adjacent structures at each subsequent pregnancy.

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## Penicillin in Udders

Funke, Hansson & Ullberg of Sweden report as follows on the "Distribution of Penicillin in Udders following Intramammary Injection:" "The penicillin was prepared both as aqueous solutions and as suspensions in oil. In normal udders a fairly uniform distribution was obtained and the small differences between aqueous penicillin and penicillin in oil seem to be of no significance."

"In mastitic udders, the existing inflammatory changes so influence the distribution that treating acute mastitis with severe inflammatory changes seems to be of little value, no more than treating chronic mastitis with proliferation of epithelial cells or the interstitial connective tissue."

# General Practice Topics

**Here each month are published Suggestions, Tips and Notes from V.M. Reporters**

# A. V. M. A. Convention Notes

## Turkey Ornithosis

Results of diagnostic tests in turkeys over a period of several years in Minnesota and Wisconsin offer evidence of a widely distributed ornithosis agent of low virulence in turkey flocks.

While veterinary inspection of poultry products from trade channels protects the consumer, the low virulence strains of ornithosis virus may represent a public health hazard to personnel in turkey processing plants.

*Dr. B. S. Pomeroy,*
*College of Veterinary Medicine*
*University of Minnesota*

## Staphylococcus Mastitis

Drug sensitivity testing indicates a changing susceptibility of staphylococcus to commonly used compounds. Cultural analyses of milk samples from all over California indicate that staphylococcus continues to be the most prevalent mastitis causing organism in the area.

Environmental effects on the tissue defense mechanism of the lactating udder are considered important factors to mastitis control. Control programs are directed primarily at limiting the spread of infecting organisms in the herd and reducing environmental stresses on the udder. Immunization programs, while of great interest, can't be recommended until additional results confirm their effectiveness.

*Dr. Allan C. Pier,*
*School of Veterinary Medicine,*
*University of California*

## Vibriosis In Beef Cattle

Recognized abortions are the exception rather than the rule in cases of vibriosis. The primary effect is often unspectacular and unrecognized by the owner. It may continue for years in the form of a strung out, below normal calf crop. This is particularly true in large herds and in range areas.

The transmission of bovine vibriosis is primarily venereal. An intestinal bovine

vibriosis which results only in sporadic abortion has been described in Europe. It probably exists here, but is not known to be a major problem. It should be differentiated from the venereal form so preventive measures can be properly directed.

Most infected bulls and some infected cows will carry the venereal infection from one breeding season to the next. Treatment can be effective in either sex in a high percentage of cases but successfully treated animals are highly susceptible to reinfection.

When pregnancy diagnosis, preventive veterinary medicine, and progressive breeding practices are being used in a herd, vibriosis may be prevented or eradicated with but a little additional effort.

Recommendations for maintaining a vibriosis-free herd include: Isolation of all additions to the breeding herd until proven clean, quarantine of repeat breeders and aborting cows until the condition is diagnosed, breeding with clean bulls or treated semen.

*Dr. R. B. Lank,*
*Louisiana State University*

## Urinary Calculi

Concentrated rations, stilbestrol implantations and severe weather can increase the tendency for formation of urinary calculi in feedlots. There appears to be a direct correlation between the rate of growth, climatic stress, and the formation of calculi in range cattle.

Feed and age are determinants in the rate of growth and management determines the effect of environmental factors. Force-feeding of salt is recommended in conjunction with good management to help prevent the formation of urinary calculi.

*Dr. R. H. Udall,*
*College of Veterinary Medicine,*
*Colorado State University*

## Anaplasmosis Control

Infected deer complicate the problem of anaplasmosis control in California cattle. The disease is of greatest importance among beef cattle that spend all or part of the year on range land pastures. Deer in this area have a high incidence of latent anaplasmosis. Large populations of deer occupy range lands with cattle, constituting a source of infection that is not likely to be controlled.

The ticks of the area that are believed to be the chief agents of transmission have a number of mammalian hosts, adding to difficulty of an approach to control by dipping cattle. Livestock owners must be cautioned of the dangers of importing animals from places where there is little or no anaplasmosis. Animals having no previous exposure to infection are highly susceptible to anaplasmosis infection.

*Dr. J. F. Christensen,*
*School of Veterinary Medicine,*
*University of California*

## Antibiotics In Milk

In test runs on seven penicillin preparations injected intramuscularly in cows, all showed penicillin contamination of their milk. Milking each animal twice daily, it was found that four of the preparations were detectable 96 hours after injection while the remaining three samples were detectable up to 10½ days after the final injection.

*Dr. L. C. Harold,*
*Food and Drug Administration*

## Parasite Immunity

The molting period of intestinal worm larvae is an important time for stimulation of protective immunity in the host animal. Substances given off by intestinal worms during their molting period stimulate antibody production in the host animal. The antibodies prevent further development of the larvae of intestinal worm parasites during the molting state, and it may be possible to produce an effective vaccine. Perhaps the greatest danger in use of intestinal worm vaccines is the tendency to imagine that a vaccine against one parasite will protect against all.

*Dr. E. J. L. Soulsby,*
*Great Britian*

## Bovine Lymphosarcoma

For many years bovine lymphosarcoma was considered a problem limited to the individual affected by the disease. European veterinarians, however, have found this disease to be common in certain herds. The Danish government has instituted a control program for it as an infectious disease and any cases diagnosed must be reported.

Apparently, bovine lymphosarcoma is a viral disease with the manner of transmission still unknown. The number of animals condemned for lymphosarcoma in the U. S. has more than doubled during the past ten years.

*Dr. G. H. Theilen,*
*School of Veterinary Medicine,*
*University of California*

## Leptospirosis In Man

Leptospirosis in man appears to be far more common than is indicated by available reports. During the past two years 39 cases of acute leptospirosis were identified among meat plant workers, farmers, veterinarians, and students.

A localized epidemic identified as a result of *Leptospira pomona* infection revealed 40 cases, probably caused by swimming in ponds contaminated by waste from infected animals. Leptospirosis should be suspected when persons in certain occupations report illness accompanied by severe headaches, neck pains, and backache.

*Dr. R. R. Tjalma,*
*University of Iowa*

## Overdue Calving

Overdue calving is an hereditary factor in some dairy cattle breeds. The condition is the result of a recessive gene in the animal's hereditary make-up. The cow and bull must both be carriers in order to produce the condition.

When delivered at the normal birth time by caesarean section, overdue calves show normal development but are much heavier than normal-term calves. Most young animals, carried past normal delivery time, are born alive but fail to live to a useful age.

Serious consequences could result from use of semen from a carrier-bull if it should unknowingly be used in artificial insemination service. Progeny testing of bulls before placement in artificial service is the best protection.

Several cows have been observed that delivered live calves 360 days after conception, while one cow carried a fetus as long as 526 days.

*Dr. H. Parker,*
*School of Veterinary Medicine,*
*University of California*

## Meat Products Safe

Recently, U. S. Public Health Service veterinarians surveyed local retail markets for signs of potential bacterial contaminants in food for sale. Nationally distributed meat products tested for Salmonella organism, staphylococci and *Clostridium perfringens* proved negative to tests.

*Dr. J. H. Richardson,*
*U. S. Public Health Service*

## Space Research

Before man can penetrate space, a reliable life-support system must be completed. Interpreting animal research data for applications to man is the veterinarian's role in the nation's biosatellite efforts.

An additional benefit of this research is the development of special monitoring devices to record electrophysical signals when animals are launched into space. Heart action, respiration and muscular activity under the stresses of space flight can be reliably recorded. These new instruments offer the promise of speeding diagnostic procedures for veterinarians in more commonplace practice with farm and pet animals.

*Col. H. A. Gorman,*
*Brooks Air Force Base*
*San Antonio, Texas*

# Field Report: Therapeutic Management of Urinary Calculi in Cattle

R. A. BALDWIN, D.V.M.
Gillette, Wyoming

Urinary calculi or urolithiasis is a disease which occurs in all species of animals, but is most common and of greatest economic importance in cattle and sheep. It is characterized by the concentration of crystalline salts forming concretions within the urinary tract. Calculi of cattle generally are calcium, magnesium and ammonium phosphates[4] and when present in large numbers, they may obstruct the passage of urine and lead to retention.

Investigators[6] have postulated the occurrence and possible cause of urinary calculi as being associated with either the limited consumption of water under severe winter conditions or with the intake of too much protein by animals. This condition is found to be most prevalent in steers. Another cause may be the consumption of rations with a high mineral content, particularly potassium.[1,3]

Surgical removal of the calculi has been the most common and successful treatment used to relieve this condition,[4,5,7] but due to inherent difficulties of surgery, results are not always favorable.[4] Since recurrence may be possible, necessary care must be given to the diet and care of the animal.

Intramuscular injection of 10 cc. of Depropanex (Merck, Sharpe & Dohme) has been reported to be beneficial in relieving urethral spasms and in facilitating the passage of stones.[5]

Limited data from investigators[3] revealed successful results from the use of acetazolamide (Vetamox—American Cyanamid) in the treatment of cattle with urinary calculi and for the control of udder edema and retained placenta in dairy cattle.

Acetazolamide is a compound which inhibits the action of the enzyme carbonic anhydrase; and one significant effect is diuresis. The mechanism of action is that of blocking the formation of bicarbonate in the renal tubules, keeping the blood electrolyte change to a minimum. Thus, excessive fluids which are retained in the blood stream and body tissues are excreted by the kidney. The pharmacology of acetazolamide has been studied primarily in the dog. Unfortunately, data indicating specific action in cattle is unavailable at this time.

In the control of urinary calculi it is necessary that treatment be instituted early; however, if a stone is palpable, it should be removed surgically.

The present report concerns the treatment of clinical symptoms of urinary calculi in steers where acetazolamide is the only source of treatment used.

## Materials and Methods

Twelve steers with urinary calculi were selected for treatment. In each case, treatment consisted of 500 mg. of the parenteral solution administered intramuscularly followed by an oral dose of 2 gm. b.i.d. in powder form. Duration of treatment varied from two to five days.

## Results and Discussion

The diagnosis of urinary calculi in this area is usually based on the following symptoms: tail wringing, difficult and painful urination and a slightly elevated temperature in nearly all cases. When a stone was not palpable*, we instituted therapy with acetazolamide.

We have occasionally used Combiotic (Pfizer & Co.) where the condition has been accompanied by a rise in temperature because of the possibility that the temperature rise may be due to a concurrent bacterial infection. It is entirely possible, however, that the rise in temperature may be associated with the pain caused by the calculus, rather than due to an infection.

The results of this study are recorded in Table 1. Of the 12 cases, eight steers (67.0%) completely recovered with no additional treatment. Three steers, in which treatment was instituted late in the course of the condition, and in which no stone was able to be palpated, did not respond to treatment with acetazolamide. Recovery was effected in each animal by amputation of the penis and exteriorization of the urethra at the site of amputation.

One steer died following rupture of the bladder two days after treatment was instituted. Since no stone was palpable in this steer, it was assumed that the stone was quite high and that the condition had existed for some time prior to the initiation of treatment.

*Steers are "stretched-out," a six inch incision is made just anterior to cod, penis is drawn through incision and palpated anteriorly and posteriorly.

## Summary

Acetazolamide was used for the control of urinary calculi in 12 steers. A review of the studies shows successful recovery in eight of 12 (67.0%) steers which received therapy. Treatment varied from two to five days, with one animal showing complete recovery within one day. Of the four steers which did not respond to treatment, three underwent surgery and the remaining one died.

Acetazolamide was most successful in cases that were treated early and before the calculus was able to be palpated at the sigmoid flexure portion of the urethra.

In evaluating acetazolamide it is important to consider that additional investigations are desirable in the study of this therapy for the control of urinary calculi.

TABLE 1. Summary of Results of Treatment of Urinary Calculi with Vetamox Acetazolamide

| Route of Administration | No. of Days | No. of Cases | Recoveries | No Response |
|---|---|---|---|---|
| 500 mg. IM followed by 2 gm. B.I.D. orally | 2 | 5 | 2 | 3 |
| 500 mg. IM followed by 2 gm. B.I.D. orally | 3 | 5 | 4 | 1 |
| 500 mg. IM followed by 2 gm. B.I.D. orally | 4 | 1 | 1 | — |
| 500 mg. IM followed by 2 gm. B.I.D. orally | 5 | 1 | 1 | — |
| Total | | 12 | 8 (67.0*) | 4 (33.0*) |

*=Percent

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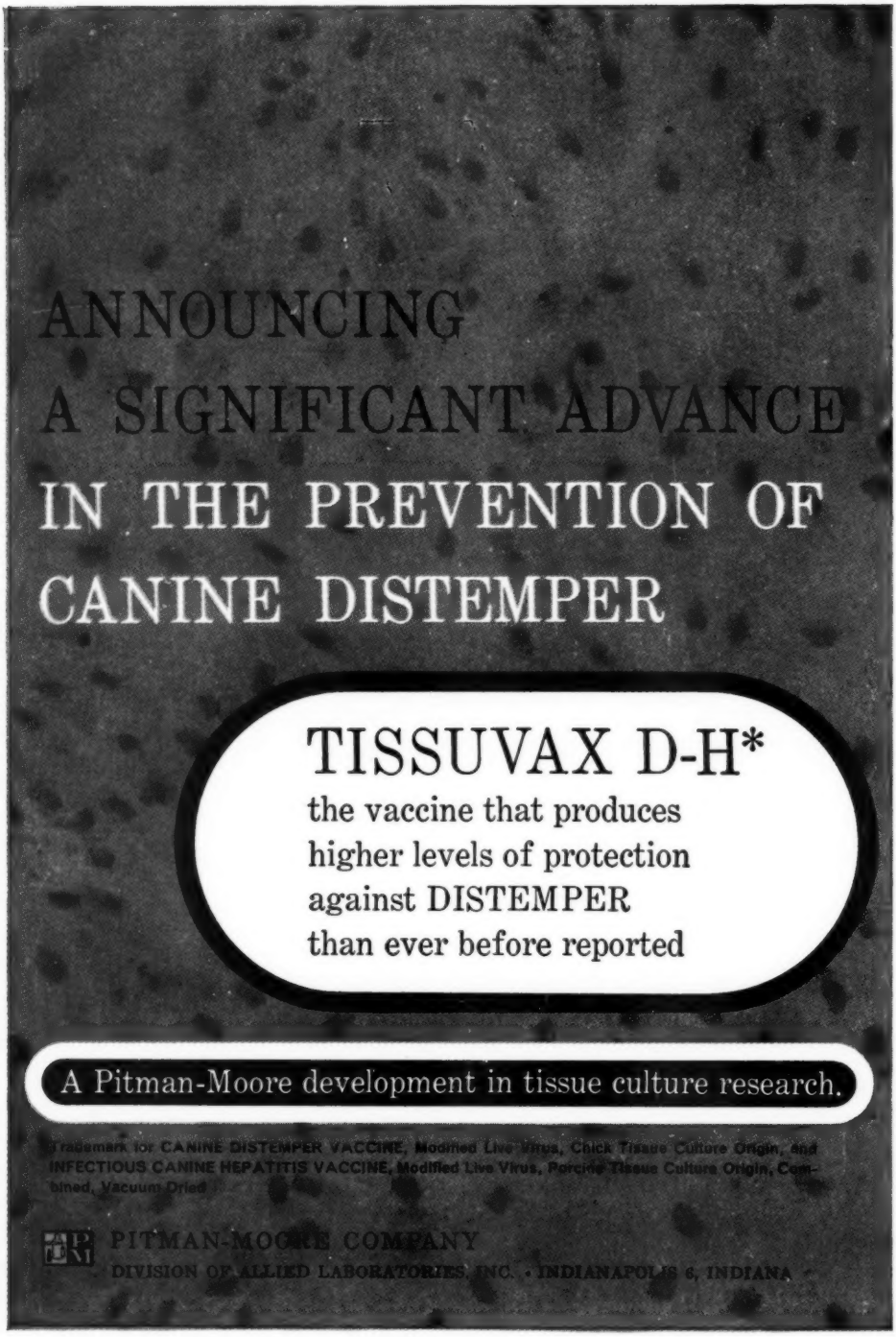
# SMALL ANIMAL PRACTICE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# A "Quick" and "Clean" Method of Evaluating Canine Distemper Products

VINCENT MARSHALL, M.S., D.V.M.
ROBERT W. BAILEY, D.V.M., M.P.H.

Corn States Laboratories
Omaha, Nebraska

## Introduction

Precision is the keynote in the evaluation of experimental results. When measuring the effects of biological materials in terms of clinical responses in animals, precision is often difficult to attain. Unless criteria are established which permit "black or white" determinations, the variables introduced by interpretation of clinical signs may be misleading. The evaluation of protection afforded dogs against canine distemper is a case in point.

Experiments which have been designed to demonstrate protection against challenge with virulent canine distemper virus frequently describe results in terms or phrases which are open to a variety of interpretations. "Distemper signs", "mild or severe reactions", and "sick" or "not sick" are a few of the more frequently encountered such terms. This report describes the use of a challenge method which has brought uniformity, increased speed of interpretation, and precision to the evaluation of canine distemper biological products.

The report of Gillespie *et al.*[1] concerning an agent which regularly produced encephalitis when inoculated intracerebrally, and which had been fully identified as canine distemper virus by cross immunity and neutralization tests was of great interest in this connection. This agent, designated Snyder-Hill canine distemper virus strain, was obtained* in the form of frozen infective brain tissue. Gillespie also described a technique for intracranial inoculation of dogs, wherein the cranial cavity was penetrated by means of an electric drill. This method proved to be impractical and unwieldy for the scale of experimentation planned by the authors. The technic evolved and described in this paper proved to be a faster and less traumatic means of entering the cranial cavity for purposes of virulent virus inoculation.

*Courtesy of Dr. James A. Baker, Veterinary Virus Research Institute, New York State Veterinary College, Ithaca, New York.

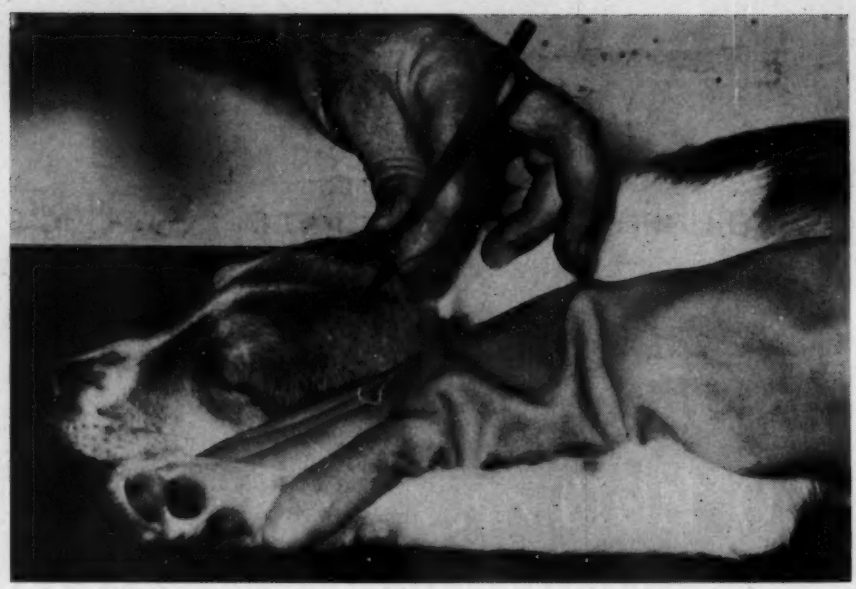

*Figure 1. Proper placement of awl.*

## Materials and Methods

A safe, ultra-short acting anesthetic which produces complete surgical relaxation is essential. In a series of over 500 dogs, methohexital sodium (Brevane — Corn States Laboratories) at the level of 5 mg. per pound of body weight, administered intravenously, was found to be ideal for this purpose. A dental tartar scraper, simply adapted into an awl-shaped instrument by removing the scraper end and grinding a point onto the shaft, is placed over the properly disinfected skin, point down, as illustrated in Figure 1. The position is approximately 1 cm. lateral to the midline, half way between the caudal margin of the orbit and the nuchal crest. The awl is held loosely in the fingers as illustrated, and tapped lightly with an 8 ounce hammer. Penetration can be sensed by finger contact with only a minimum of experience. After the cranium has been pierced, the inoculum is introduced in the cerebrum. A 26 gauge, ¾" needle is used, carefully inserted through the opening up to the hub in an oblique direction. (Fig. 2) The inoculum consists of 0.25 to 0.50 cc. of a 1:100 dilution of brain or spleen tissue from the 36th passage of the Snyder-Hill virus strain in dogs. After the injection has been made, the needle is removed, the skin slipping naturally over the wound. No dressing is required, and an occasional minor hemorrhage is easily controlled by pressure. Death occurs in susceptible dogs usually between the sixth and eighth day following challenge, often with only a few premonitory symptoms.

*Figure 2. Inserting the needle in an oblique direction.*

## Results and Discussion

The problem which this technic helped solve for the authors was the rapid and valid evaluation of a newly developed, modified live virus canine distemper vaccine of tissue culture origin. Using this technic, it has been possible to routinely inoculate dogs at the rate of one per minute. Unvaccinated control animals would be dead six to eight days following challenge, and surviving vaccinates could be considered protected 14 to 21 days following inoculation. In these studies, and in the production of virus for tissue vaccine, the technic has been used in over 500 dogs. In both of these uses, the technic has eliminated the necessity for daily temperature-taking and evaluation of obscure clinical signs, survival or death in susceptible dogs becoming the clear-cut means of determining protection. In this series, 96% of the dogs found to be susceptible by serological studies showed severe neurological manifestations, and 94% died. This evaluation technic has proved especially suitable for the study of modified live virus vaccines. Experimental results indicate, however, that the challenge may be too severe for inactivated vaccines or canine serum products. The method also has great value in the rapid routine production of large amounts of high titer canine distemper tissue virus for inactivated vaccines.

## Summary

A method is described which has increased the speed and reliability of evaluation of canine distemper immunizing agents.

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# Ectopic Ureter

# A Report of Two Cases

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Urinary incontinence in bitches is a problem which is frequently encountered in small animal practice. The causes of this condition are many. In the two cases described in this paper the cause was malposition of the ureters.

This condition, as far as the authors are aware, has not been described in veterinary literature aside from a case reported by Singer.[1] The possibility of its occurrence has been mentioned by Bloom,[2] "On an embryological basis, however, there are many possibilities of occurrence—, of extravesical termination into any of the male and female sex organs". Borski and Parsons,[3] have reported ureteral ectopia as a cause of urinary incontinence in young girls.

## Case No. 1

The patient was a six-month-old Scottish Terrier bitch with a history of urinary incontinence of "several months" duration. She had been treated for vaginitis and cystitis without avail. The dog was of normal size, alert and in apparently good health. Constant dribbling of urine occurred. A small bladder of normal consistency was palpable through the abdominal wall, and no evidence of vaginitis was present. Bladder catheterization on two occasions failed to produce a urine sample. Urinalysis was carried out on a small sample which was collected following micturition; no abnormal constituents were found. Radiological studies showed two kidneys of normal size and shape. A cystogram showed a small urinary bladder which was normal in shape and contour, and there was no evidence of cystitis.

A laparotomy was performed. This showed that the bladder was small and undistended and that both ureters terminated in the vagina. Euthanasia was performed and an autopsy confirmed the intravaginal termination of the ureters.

## Case No. 2

A 2½-year-old, spayed Scottish Terrier bitch was admitted to the clinic for treatment of urinary incontinence. The owners

*Fig. 1. (Case 2) Combined intravenous pyelogram and cystography showing the hypolastic left kidney and it's ureter with renal pelvis and a portion of ureter of the right kidney. The right renal pelvis is small. Sketch below will aid visualization of larger left renal pelvis and small right renal pelvis.*

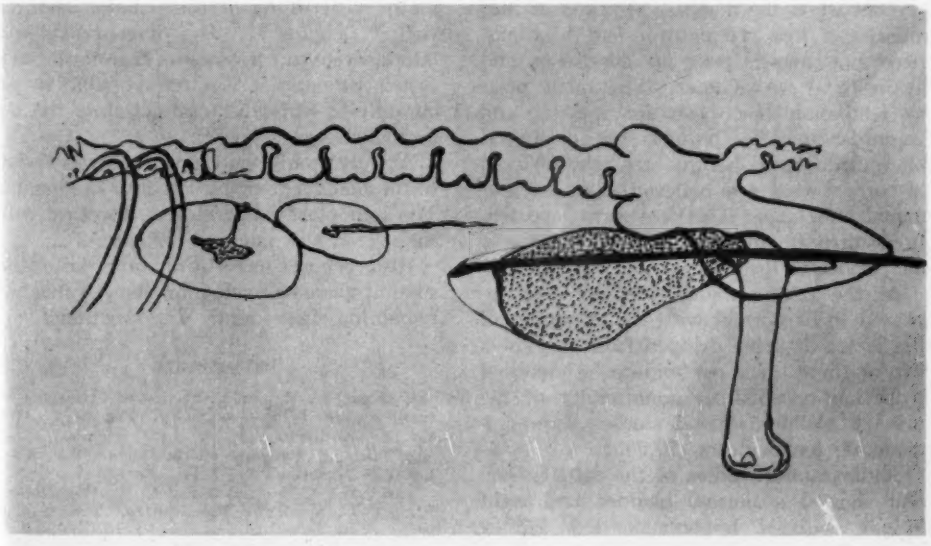

*Fig. 2. (Case 2) The hypoplastic left kidney and it's ureter.*

of the animal stated that incontinence was present when the dog was acquired at four months of age. Hematuria had been noticed one month prior to admission and again three weeks later. Treatment prior to admission had been for cystitis and vaginitis. As the patient was a spayed bitch, stilbestrol therapy was administered to correct what was believed to be an hormonal imbalance. This treatment reportedly resulted in normalcy on two occasions, for periods of three weeks and one week.

At the time of admission the dog appeared to be normal with the exception of the fact that urine dripped from the vulva two or three times per minute. Abdominal palpation revealed no abnormality of the urinary bladder. Blood studies showed a moderate leukocytosis (27,000).

Radiographic studies of the urinary system showed a normal bladder and right kidney with a hypoplastic left kidney (*Figure 1*). Both kidneys excreted normally with filling of the bladder and the vagina (*Figure 3*). The diagnosis of unilateral ureteral ectopia was therefore established although it was not possible to accurately identify the termination of the abnormal ureter.

At laparotomy the right ureter was traced to the bladder and the left into the vagina. The hypoplastic left kidney, together with the ureter, was removed, (*Figure 2*).

Recovery was uneventful and a postoperative intravenous pyelogram showed that the remaining right kidney was functional.

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*Fig. 3. (Case 2) Both kidneys are visualized and are excreting contrast medium.*

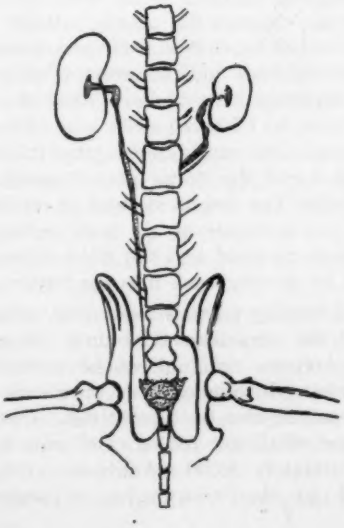


*Fig. 3A. Schematic drawing of figure 3, identifying left renal pelvis and clearly defined ureter. Note small right renal pelvis and course of ureter.*

# Small Animal Clinic

**Here each month are published Ideas, Suggestions and Comments picked up by V.M. Reporters**

## Intraperitoneal Dialysis In Uremia

Intraperitoneal dialysis is a practical procedure for reducing acute blood urea levels to as low as 40 mg. percent. This is the most efficient procedure available short of the artificial kidney used in human medicine. It is particularly indicated in an acute crisis as a patient may be carried for 24 to 48 hours until electrolyte balance can be restored. It is not a difficult procedure.

The uremic, depressed dog should not be anesthetized. Local anesthesia is used at the injection site of the trocar. Vi-Drape, a plastic sterile drape is applied to the abdomen after spraying the dog with the accompanying spray. This material is suitable for practically any type of abdominal surgery. It provides probably the most aseptic type of drape possible as it is impervious to moisture and adherence to the skin virtually eliminates seepage. The incision is made through the drape.

A small incision is required posterior to the umbilicus to allow passage of the trocar. With the trocar in place a plastic tube may be inserted. A secret to success is use of the special plastic tubing supplied by solution manufacturers which has multiple perforation clear to the tip. The tubing is long enough to be moved around the peritoneal cavity. Maximum drainage is essential to efficient dialysis. There are two types of dialysing solutions, one isotonic, the other hypertonic. Isotonic is ordinarily used. The hypertonic solution contains glucose and balanced electrolytes and is used primarily to withdraw body fluids.

Dialysing solution is run from the 1,000 cc. bottle through the plastic catheter at a rather rapid rate. Watch for overdistension of the abdomen and excessive pressure on the diaphragm. A medium sized dog can handle up to 1,000 cc. After administration of almost the entire bottle the tubing is clamped and the bottle placed upright on the floor. The dog is allowed to retain the fluid for upwards of an hour before the clamp is removed and the fluid allowed to drain by gravity back into the bottle.

It is usually possible to recover within 50 cc. of the administered volume. Recovery of hypertonic solution would exceed the administered volume. This procedure may be repeated two or three times. Cost including solutions, tubing, and catheter is approximately $2.00. Antibiotics may be added to the solution as a protective

measure against peritonitis and addition of heparin will help control fibrin formation. Only a few drops are required.

*K. W. Smith, D.V.M.*
*Colorado State University*

## Practice Tip

We have discovered an excellent rust inhibitor and paint for ferrous metal cages. Previously we had tried a number of products that claimed effectiveness, and found them lacking. The inhibitor of oxidation is a mixture of acids which combine chemically with the oxidized metal, rendering it sound for application of paint. The paint itself is a laquer-like product which gives a glass hard finish suitable for proper sanitation. Any paint will scratch when determined animals attack it with sharp nails and this material has that disadvantage. The products have been in use for seven months and were obtained from Walter Wurdack, Inc., 4977 Fyler, St. Louis, Missouri.

*H. C. Eschenroeder, D.V.M.*
*8088 Watson Road*
*St. Louis 19, Missouri*

## Biological Stains

A new technical reference booklet dealing with the uses of Biological Stains has been published by Allied Chemical's National Aniline Division.

The 12-page booklet cross-indexes an alphabetical listing of the principal uses of Certified Biological Stains and Biological Stains supplied by National Aniline, grouped according to the field in which the stains are used.

Since all biological stains certified by the Biological Stain Commission are obtainable from National Aniline, this comprehensive cross-index serves as a reference aid to the student of laboratory technology, the established laboratory technician and those engaged in general scientific research.

Copies of the booklet, "Biological Stains — A Cross Index," are available from Allied Chemical's National Aniline Division, 40 Rector Street, New York 6, New York.

## Procaine Toxicity May Be Increased By Epinephrine

Inclusion of epinephrine in local anesthetic solutions may enhance rather than reduce systemic intoxication.

Epinephrine-induced local vasoconstriction has been thought to cause more gradual absorption of anesthetics. Addition of the hormone to procaine, piperocaine, ylocaine, or dibucaine injected beneath the dorsal skin of mice, however, fails to reduce toxicity.

Addition of 1:50,000 epinephrine seems to increase procaine toxicity. Under most conditions, piperocaine toxicity also appears to be enhanced by epinephrine.

*Proc. Soc. Exper. Biol & Med.*
103:353-355, 1960.

## Surgical Correction Of Ununited Olecranon

Ununited olecranon has been observed in close to 20 dogs. It has been called ectopic sesamoid bone by Stearn of California and has been encountered by Rhodes of Pennsylvania and other radiologists. The youngest case seen has been 3½ months and the oldest three years old. The usual time of presentation is six months. Severely affected patients will not bear weight on this leg. Manipulation will produce pain. It is sometime crepitous but not always. When standing the elbow will deviate outward. There is some distention of the joint capsule. Sometime a radiographically typical triangular piece of bone will be seen in the joint capsule. The bone fragment lies in the olecranon fossa and is separated from the olecranon process by a definite line of cleavage. In long-standing cases there may be a calcific deposit and osteoarthritis.

Correction of this condition is surgical. An incision is made on the lateral surface

of the humerus, starting at a point two in. above the humeral radial joint and extending to a point two in. below this joint on the ulna. The skin is incised along with the anconeous muscle and joint capsule to gain entrance to the joint space. A loose piece of bone is elevated out of the joint space using a periosteal elevator. To detach this piece of bone from the joint capsule, its attachment at the posterior aspects of the joint capsule is cut with scissors. There is some degree of hemorrhage that can be controlled with gauze packs for a few minutes.

The joint is washed out with a solution of crystalline antibiotic. Closure is made with a series of small interrupted gut sutures. The muscle and skin are closed in a similar manner. The patient is no lamer the day after surgery than before. The leg is bandaged firmly after surgery and left in place five days. These patients will walk 10 days after surgery without evidence of lameness. The outward deviation of the elbow is not corrected by the operation but it is not lame.

*Dr. J. Archibald*
*Ontario Veterinary College*

## Marking of Surgical Specimens

Use of consecutively numbered Michel skin clips permits quick and indelible tagging of all pertinent anatomic sites on specimens. During operation, as the surgeon encounters new areas that should be identified, the next numbered clip from a rack of 25 is applied. The number, with the proper anatomic index, is written on the pathologic sheet immediately. The clips facilitate pathologic examination and better enable the surgeon to judge the adequacy of the resection.

*Am. Surgeon 26:257, 1960.*

## Killed Tuberculosis Vaccine

A vaccine made from phenol-killed human tubercle bacilli provides at least as much protection to guinea pigs as living BCG, under some conditions. According to Dr. David W. Weiss of the University of California, Berkeley, and the late Dr. A. Q. Wells of the University of Oxford, England, extent of increased survival after inhalation infection with virulent tubercle bacilli depends on dosage, route and vehicle of administration, and length of time between vaccination and the challenge. Effective quantities of nonliving vaccine do not cause gross manifestations of toxicity. Use of killed tuberculosis vaccine in human beings should be considered seriously.

*Am. Rev. Resp. Dis. 81:518-538, 1960.*

## Pyelonephritis Studies Relate Potassium Levels

Rats with renal lesions resulting from potassium depletion have increased susceptibility to induced pyelonephritis, even after an extended period of potassium repletion.

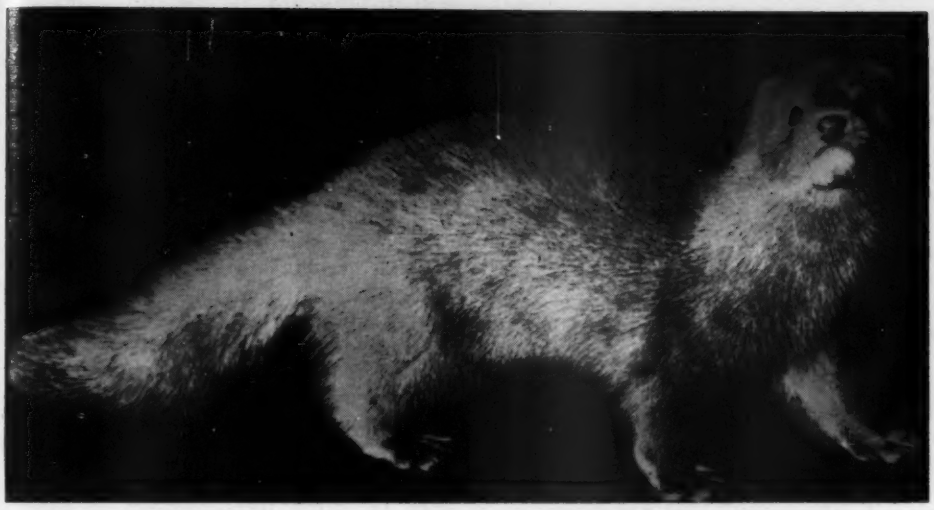
Administration of potassium-deficient meals for four weeks dilates the renal tubules. The tubular dilation persists after the rats have ingested food rich in potassium for about half a year. The persistent nephropathy predisposes the rats to pyelonephritis upon injection of Escherichia coli into the tail vein.

Of 14 rats injected with Esch. coli after ingesting potassium-deficient meals for four weeks and then potassium-rich meals for seven months, ten had varying degrees of pyelonephritis. Macroscopic abscesses in one or both kidneys were noted in seven of the infected animals. Only three of 13 control rats had pyelonephritis, and none had macroscopic abscesses.

*J. Clin. Invest.* 39:28-33, 1960.

## Thyroid Dosage for Dogs

Thyroid in the usual ½ to 5 grain dosage recommended for the dog is highly inadequate and is practically a placebo. This species requires considerably larger doses, actually from three to ten times greater for effective therapeutic results. Overdosage is characterized by palpitation, tachycardia, irritability, excitability, and restlessness.—*Atlas Newsletter.*



# Pseudomonas Infection in Mink

WM. H. BECKENHAUER, D.V.M., M.S.
C. A. MINER, D.V.M.

On October 9, 1959, a homo-pastel mink from a southeast Nebraska mink ranch was presented to the laboratory for autopsy and bacteriological examination.

*History:* 1,075 mink were located on the ranch. The breeding stock had been vaccinated against distemper. The spring kits, weaned at six weeks, had not been vaccinated.

Within each shed the pens were arranged in four rows with 40 pens per row. One service aisle served two rows of cages.

Feed consisted of a commercial dry mink feed supplemented with freezer-stored chicken gizzards. Water was supplied from an underground metal storage tank which was filled by tank truck from the city water supply.

On October 6th the mink in pen 13 was off feed. On October 7th this mink was dead and the mink in pens 12 and 14 were off feed. On October 8th these two mink were dead and the animal in pen 102 showed anorexia. This animal was dead the following day and was presented to the laboratory.

*Symptoms:* The first symptom exhibited by affected mink was anorexia, which was first observed 24 to 36 hours before death.

Later, in the brief course of the disease, the animals would show incoordinated locomotion and terminal epistaxis.

*Necropsy:* On gross examination the carcass was fat and the pelt in good condition. The stomach and the first inch of the small intestine were full of unclotted blood. One lung was solidly full of unclotted blood. The liver was very pale and tan in color. Other tissues and organs showed anemia.

*Bacterial isolations: Pseudomonas aeruginosa* organisms were recovered in pure culture from the kidney, liver and spleen. These organisms and *Streptococcus spp.* were recovered from the lungs.

*In vitro sensitivity tests:* Results of the *in vitro* sensitivity tests showed neomycin and dihydrostreptomycin to be effective in inhibiting growth of the *Pseudomonas* organisms. Penicillin, erythromycin, terramycin, tetracycline, aureomycin, triple sulfas and chloromycetin did not inhibit organism growth.

On October 12th another dead mink was presented for examination along with samples of water, feed and feed ingredients.

This mink showed the same necropsy lesions as previously described and *Pseudomonas* organisms were again recovered. Many *Pseudomonas* organisms were recovered from the water sample.

*Treatment:* Dr. G. R. Hartsough, Veterinarian for the Great Lakes Mink Ass'n., Pittsville, Wisconsin, was contacted. He reported similar *in vitro* antibiotic sensitivity tests but had better *in vivo* results using sulfathiazole.

Medication was administered through the feed. Each mink received 0.75 grains sulfathiazole the first day and 0.50 grains for an additional five days.

The water tank truck and underground water storage tank were treated with a 0.4% solution of formaldehyde. The solution was held in the tanks 24 hours.

*Results:* Losses stopped following the death of eight mink and treatment of animals and water containers.

*Summary:* A case report of *Pseudomonas aeruginosa* infection in a mink ranch is described.

REFERENCE

Hartsough, G. R., *Personal Communication*, 1959.

## Educators Recommend Radiology Board

The annual meeting of the Educators in Veterinary Radiologic Science in Chicago last November unanimously approved a resolution concerning the formation of a veterinary radiology board. The resolution reads as follows:

"The Educators in Veterinary Radiologic Science recommend to the American Veterinary Medical Association Council on Education that an examining board be established for veterinary radiology." It was recommended that the original board be selected from qualified applicants by a nonpartisan committee selected by the Council on Education.

A motion was made that the acceptable terminology for exposed and processed x-ray films be either roentgenogram or radiograph. Terms to be discouraged are: picture, x-ray picture, x-ray, x-ray plate and radiogram.

The E.V.R.S. was organized two years ago and is made up of veterinarians and physicians responsible for teaching veterinary radiology in the North American veterinary colleges and post-graduate training institutions.

## Cornell University Names New Structure

The administration wing of Cornell University's New York State Veterinary College has been named Jacob Gould Schurman Hall, in memory of the third president of the University. Other facilities of the Veterinary College now bear the names of former distinguished members of the College's faculty. The structures which have been named are part of the new physical plant of the College which was completed three years ago.

Jacob Gould Schurman was president of the University from 1892 until 1920. It was during his administration and largely through his efforts that the first state-supported college—the Veterinary College—was established at Cornell in 1895.

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# Clinical Report: Ringworm Therapy in the Dog and Cat

LEWIS M. TARR, D.V.M.

Within the past year, a clinical evaluation study was made on the effectiveness of oral griseofulvin (Fulvicin)* in the treatment of ringworm in the dog and cat. Most of the cases involved were treated on an outpatient basis.

Keratin and hair, in a very real sense, are the end products resulting from the physiological activity of the cells comprising the epidermis. The growth and eventual exfoliation of keratin and hair, proceed at about the same rate. Wilson[1] speaks of this outward growth as the "epidermal effluvial current." He makes the point that to cause parasitism the downward rate of growth of the invading fungus must equal or exceed the rate of the epidermal effluvial current toward the skin surface.

Griseofulvin, after absorption from the upper intestine, is distributed to several sites by the blood stream, including the keratogenous cells which are destined to form keratin. The drug is deposited in these cells in sufficient concentration to cause its typical fungistatic effect, resulting in the curling and stunting of the invading fungal hyphae. The hyphae, therefore, are not able to maintain themselves as the normal physiological growth of these structures, or the aforementioned "epidermal effluvial current" results in their being sloughed away from the body with consequent healing of the affected areas.

It is well established that dermatophytes are not able to survive in the deep body tissues, and in the great majority of cases they thrive only in the keratinized portions of the skin. The layer of keratin varies in thickness in different areas of the body and also in structures such as nails. This fact is important in relation to length of therapy, for a mycological cure cannot exist until the affected structures have been swept away by the normal growth cycle. In the case of infected nails, this may require months to occur.

Man and animals, particularly those animals in close contact with man, such as household pets, are both susceptible to a number of the same fungi causing dermatophytoses. Cross infection between the different species occurs with some frequency.

*The griseofulvin used in this study was furnished as Fulvicin through the courtesy of the Department of Veterinary Clinical Research, Schering Corporation, Bloomfield, N. J.

In several of our cases, the pet owners were under treatment for ringworm with griseofulvin with their infection sometimes preceding the appearance of the disease in their pets. The veterinarian has the obligation and opportunity to explain the infection cycle to the client. This serves not only as a sound public health function, but also as good public relations for the profession.

A resume of the historical background on griseofulvin is available in Kaplan and Ajello's[2] excellent paper on cat ringworm.

In the study conducted in my practice, 18 feline and 23 canine cases representing primary or secondary ringworm infection were successfully treated with griseofulvin.

The criteria used in establishing a diagnosis of ringworm were based on history and clinical findings, fluorescence under a Wood's light and culture of suspect hair and skin detritus on Mycosel agar (Baltimore Biological Laboratories). In many cases, all three of the criteria were not positive, but at least two of the three had to be satisfied before a diagnosis was reached.

In over one-half of the cases seen, symptoms had been present for a month or more, and in some instances for as long as three or four months. In the canine, lesions might be found on any part of the body and although some of these cases exhibited the classical circular lesions, many did not. For example, in some cases an entire leg might be involved, including the digits; in others the lesions would be more discrete or localized. Practically all of the infected areas were completely denuded of hair or contained broken hair shafts. Most exhibited a greenish-gray cast and rough, scabby skin with the periphery showing some slight elevation as well as varying degrees of erythema.

In the cat, the affected areas of the skin were usually localized in character and frequently involved the legs, chin, upper lip, nares and ears. The classical circular lesion

Photo by E. F. Donovan, D.V.M.

*Microscopic view of ringworm infected hair.*

of ringworm appeared more often in this species than in the dog. Also, a larger number of positive cultures of *M. canis* were found in the cat.

In many of the cases presented a variety of external fungicidal agents had been used prior to oral griseofulvin therapy. However, once these cases were placed on oral therapy, no external medication was used. External fungicides may be indicated, however, to minimize reinfection and shorten the duration of oral therapy.

## Dosage

In the feline, the dosage of griseofulvin varied from 62.5 mg. to 250 mg. daily on once-a-day medication. In the canine, the dosage varied from 125 mg. to 500 mg. daily on once-a-day administration. In general, the dosage used depended on the body weight of the treated animal, and in this series of cases, the largest animal treated weighed approximately 25 lbs.

In the feline, the duration of therapy varied from three to eight weeks and in the canine from three to 11 weeks. In each case, however, the criterion for a complete cure was the complete replacement of hair in the affected areas, and griseofulvin was administered until this occurred. Undoubtedly, a mycological cure existed before this took place.

One particular case of chronic otitis externa in a dog, however, deserves mention. This animal had been treated for over three years with a variety of local medications by a number of veterinarians, including myself, without success. An antibiotic sensitivity test was finally performed and showed that a sulfonamide combination was the drug of choice. The condition improved slightly under this treatment, but soon regressed to its original state. On a purely empirical basis griseofulvin therapy, at the 500 mg. per day level, was instituted. In six weeks a definite improvement was seen, with a very noticeable decrease in the rancid, offensive odor associated with this condition.

Metibiotic mastitis ointment (Schering) was then used as adjunctive therapy in combination with griseofulvin, and at the end of nine weeks the ear, although thickened, was free of infection. The ear remained in this state for about six months when a slight exacerbation was noted. Therapy with griseofulvin was reinstituted and the condition again cleared.

The culture of material from some of the chronic cases of otitis externa might reveal fungous infections to be a more common cause of this condition than is ordinarily thought. As a rule, such chronic cases usually respond best to aural surgery.

Reinfection may be a problem where animals are from the same establishment or household. Sometimes infection may not be directly transmitted from animal to animal. For example, in one kennel the source of infective material was from felt padding exposed by a crack in the linoleum floor covering. On culture of the felt padding, *Microsporon canis, Trichophyton mentagrophytes,* and a Penicillium species were isolated. When the floor defect was remedied, reinfection ceased. Where infection has existed, it is advisable to destroy all old bedding and litter. Kennels and cages should be thoroughly scrubbed and disinfected with any fungicidal antiseptic of choice.

Five cases in dogs from a breeding kennel are not included in the data because in these cases, the owner refused to medicate for longer than two weeks, due to the lack of spectacular results. Clients should be advised that for positive results, the length of therapy is fairly long. The results are predicated on the time required for infected keratin, hair and nails to be replaced by normal structures, which in turn is based on the physiological growth rate of the structures involved. Since griseofulvin is mainly of value in dermatophytoses, its use should be limited to reasonably well proven cases of superficial fungus infection.

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# Editorial:

## Why a Special Small Animal Journal?

The files of Veterinary Medicine reflect 55 years of progress. It has grown from the small monthly bulletin in 1905, with only local distribution, to first place among veterinary publications having international circulation and scope. It has always concerned itself with supplying knowledge to the veterinarian.

Veterinary medicine is a mature science, and Veterinary Medicine has helped produce the changes necessary to give it that maturity. The publication stressed the importance of swine practice when practitioners refused to accept a call to attend illness in swine. It established a section on Canine Medicine and Surgery (now Small Animal Practice) in 1912, when even in large cities there were but one or two practitioners in pet practice.

Today we are able to announce the greatest single increase of service in this publication's long record of achievements.

Beginning in January, Veterinary Medicine will introduce an entirely new monthly journal, VM Journal of Small Animal Practice. This is not the result of a hasty decision, but the culmination of a long-time project initiated by the late editor and publisher, Dr. Robert L. Anderes.

Why a special small animal journal? Recent issues of Veterinary Medicine have carried more and more pages of small animal information. This increased coverage failed to make a dent in the material available for publication, and valuable observations were going unwrittened for lack of suitable publication outlets.

The most critical problem was the growing tendency to crowd other practice areas from VM pages when new ideas and leadership in general practice call for top priority coverage.

A recent survey of 7,000 veterinarians clinched the decision to introduce a new journal. An overwhelming 61.7% of those responding strongly urged the establishment of a small animal journal.

This expansion affords an opportunity for better service to all phases of the profession. Increasing interest in equine practice, herd management, nutrition and other important new fields can receive improved coverage in Veterinary Medicine, and the small animal literature can expand with increased attention to hospital management, complete surgical discussions and laboratory instructions without space limitations. Veterinary Medicine will also continue to carry its regular small animal practice section.

The editors appreciate the responsibilities that the future demands and through these professional journals will strive to serve the profession as it has so ably in the past.

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# Unconventional Aspects of Canine and Feline Sexuality

A. BARTON, B.S., B.A., D.V.M.
Forest Hills, New York

The interest aroused by recent publications on uncommon aspects of canine sexuality in VETERINARY MEDICINE[1,2,3] prompts the presentation of further observations on this fascinating subject.

## Masturbation

Masturbation rarely if ever occurs in the normal prepuberal or adult female. Of course, the female can be stimulated to lick its genitalia where local irritations of the external genitals occur, but this cannot be properly considered a sexual activity. In the male, on the other hand, masturbation occurs rather early in the puppy. It is performed by licking the penis or by rubbing against soft objects that can be conveniently grasped in a sexual embrace. It is rather common in puppies of about five or six months of age and often continues throughout the adult life. Reliable scientific information regarding masturbation in the dog is notably lacking, though even the most casual observation will reveal its undeniable presence. It is common in males just prior to and upon the completion of copulation. Some dogs, especially those that are bored, left alone a great deal, or those that upon maturity have little opportunity for sexual intercourse, may develop the masturbation habit. Of course, masturbation can be encouraged by any pathological factor that may stimulate the excessive flow of sex hormones. According to my observations, the masturbation habit in the dog is not ordinarily accompanied by outward physical symptoms that are detrimental to the health of the animal. To my knowledge, psychological aspects of masturbation in dogs have not been critically examined, though clinical observation seems to indicate that these effects are not especially significant. It is very unlikely, however, that the male masturbating dog conjures up any exciting mental image of the female while engaged in this activity. What is most likely is that masturbation, in this instance, is a purely stimulus-response manifestation. The masturbatory act may be stimulated, for example, simply by licking some penis discharge. This, in turn, may stimulate the animal sexually and the act is carried through to its completion. The important point is that masturbation in the dog is apparently not consciously directed to sexual self-stimulation. The stimulus that initiates it is only incidental and not necessarily sexual. Where the

stimulus is not exclusively sexual — as is the case with the dog — the most that can be said is that we are dealing with a mere masturbatory activity rather than a truly masturbatory act. Nor is masturbation in this sense "abnormal" in the dog. If a dog is properly stimulated, it will "masturbate." Thus, masturbation is a normal activity in dogs.

## Heat Period

The onset of heat is related somehow to the lengthening of the day. Under experimental conditions, the period when the dog is not in heat can be substantially shortened by subjecting it to abnormal exposure of artificial daylight. Just what specific reaction is involved here is not known, but it is very likely that this fact accounts for the variability in heat periods in dogs in different parts of the world.

Another fact of interest in this connection is that if a cat in heat is not bred, it will remain in heat for several days. If it is bred successfully, it will often lose its responsiveness in about twelve hours.

## Copulation

The act of copulation in cats lasts about five to ten seconds. With dogs, on the other hand, the duration is much longer because genital "locking" occurs. This genital "locking" is, of course, normal and after ejaculation the animals separate without assistance in anywhere from a few minutes to a few hours, with the average time being about 20 minutes.

It may be amusing to note that the longest matings in mammals occur in the mink and sable. These animals do not lock, but once intromission is achieved, it is maintained for very long periods. Several ejaculations seem to take place and there are rest periods in between. From the moment of original insertion until withdrawal, the sable has been timed to copulate for as long as eight hours.

In regard to the frequency of copulation, some male cats may copulate nine or ten times in an hour. Others may copulate four or five times before their sexual responses are subdued. In these instances, each copulation includes an ejaculation. Male dogs, on the other hand, rarely copulate more than once an hour providing copulation is complete and sexual locking occurs. This situation has a logical physiological basis. The cat, after all, must undergo intercourse as a stimulus for the expulsion of the ovum. The female dog expels its ovum naturally without the necessity of any additional stimulation. Thus, it is not surprising that the cat copulates more actively than the dog.

Though the upper limit of the responsiveness of the female dog has not been subjected to scientific tests, we can be pretty sure that it exceeds that of the male. When female cats are kept in heat artificially with hormone injections, they copulate continuously and exhaust one male after another.

Another interesting fact is that a pregnant cat will sometimes permit an active male to have intercourse with her, but this behavior is irregular and unpredictable.

## Sexual Foreplay

The essential difference between human sexual foreplay and that of the dog is that, unlike the animal, sexual foreplay in the human is consciously directed toward sexual stimulation. A male dog may lick the external sexual organs of a female in heat because it is attracted by the female discharge and its odor, but it does not perform this activity because it feels that it will excite the female. It acts, rather, as if it is merely investigating the area. But the fact is that its behavior does excite the female and excites the male too. In this manner a lusty male can stimulate a sluggish female in heat and achieve a mating. In the same way, a female in heat may sniff or lick the male organs and may thus excite a sluggish male to become more aggressive in his

mating responses. A female may also mount a male in the male copulative fashion and this activity often seems to stimulate the male.

When a male cat is about to have intercourse with a female, the tom first grasps the loose skin of the female's neck in his teeth. This action seems to have three results: it produces an erection in the male; then the female lowers her forequarters and gets into the mating position; lastly, by maintaining the grip after it has mounted, the male can more readily get into the proper position so that genital insertion can result. A male cat will rarely succeed in completing the copulatory act unless it grasps the female in this way.

Some dogs may be sexually stimulated merely by being placed in a situation where they had previously experienced intercourse. This is especially true if a breeding crate is used. There can be little doubt that sexual stimulation here is a conditioned response.

## Sexual Liaisons

Mateships, as exemplified by human marriage, are considered to be lasting sexual unions. Liaisons are temporary or casual relationships. The best that can be said of the dog is that it is an occasional party to what may be very liberally interpreted as a sexual liaison. This is more the result of circumstance than of preference. One occasionally hears of a male and female brought up in the same household who seem to develop a genuine affection and exclusive sexual preference for each other. But this is the exception rather than the rule. All that can be said for sure is that dogs show a certain amount of discrimination in the choice of sexual partners, and males do so to a greater extent than females.

## Sexual Dreams

Not only does every indication point to the fact that dogs dream, but there is further evidence that they also have sexual dreams. Pelvic thrusts have been observed in both males and females and nocturnal emissions have been seen in males. This is true of both the dog and cat. Just how much "imagination" goes into these dreams poses an interesting and challenging psychological problem.

## Bestiality

Sexual relations between animals and humans are as old as time. There are and have been sexual relations between dogs and humans. Almost every conceivable position and manipulation that can be conjured up by the lasciviously brisk imagination has very likely already been attempted. In such relationships the dog often transfers its sexual affections to the human being directly involved. A dog that is habitually masturbated by a human may transfer its sexual affections to that human to such a remarkable degree that it will cease to be receptive to females of its own species.

Sexual relations between dogs and species other than the human have also been reported. Captive female baboons that South African farmers keep chained to stakes frequently offer themselves sexually to dogs. Ford and Beach tell of a case of a female macaque that copulated repeatedly with a male dog. Copulation was performed dog fashion, the dog attaining partial entrance into the female and causing great sexual excitement in the macaque. The macaque would copulate with the dog whenever it entered the monkey's yard. On a later occasion, the monkey offered itself to a strange dog, but this animal bit off the macaque's arm. Since then, all the monkeys of the herd have shown their hostility to dogs.

## Effect of Spaying and Castration on Sexuality

Spaying promptly and permanently abolishes all sexual behavior in female dogs. These animals possess no attraction for males of their species and never display

sexually receptive behavior. The male dog that is castrated *before puberty* never develops the normal degree of sexual aggressiveness. However, these males do show a certain amount of sexual activity. They may exhibit abortive attempts to mount other dogs and may display a few weak pelvic thrusts. Prepuberally castrated dogs develop nothing more intense than the normal, prepuberal sexual behavior.

The male, castrated in adulthood, however, often shows very little decline in sexual aggressiveness. Laboratory experiments on adult castrated male cats have demonstrated that there is no decline in sexual aggressiveness over a period of several years during which they were observed. Some of them *seemed* to suffer a reduction in the ability to copulate but none were unable to do so. These observations indicate that sexual activity in female cats is much more dependent on hormones than it is in males.

### Satyriasis, Nymphomania, Frigidity

Excessive desire for sexual activity in the male is called satyriasis. Excessive desire for sexual activity in the female is called nymphomania. Lack of or subdued sexual desire in either sex is called frigidity. These conditions are much more common in the dog than is ordinarily imagined. While the causes of these abnormalities in the human are often psychological in character, there is little likelihood of such a causal relation in the dog, though the involvement of these factors is not impossible. These conditions are most often due to obvious hormonal derangements that are routinely amenable to the pedestrian hormonal and surgical procedures of every veterinarian. It is well to be reminded, however, that because male sexuality is less effected by hormones than the female, hormonal or surgical approaches will be much less certainly successful against satyriasis than against nymphomania. The frigid animal may be stimulated with appropriate hormones, but attention should also be paid to proper feeding and to cutting down on possibly excessive breeding, which may also be related to frigidity.


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## Fighting Staphylococcus

A new triple approach in fighting hospital-borne staphylococcus infection has been developed, according to Dr. H. E. Robinson, vice president in charge of research for Swift & Company.

"The three-way attack," Doctor Robinson said, "is based on prevention, and is a supplement to good sanitation."

The program involves a group of surface-active agents, each of which contains an anti-staphylococcal chemical. They are designed to control infection through treatment of linen and surfaces that might be a point of contamination, and through use of a special soap by patients and hospital personnel.

The first stage is unique in its approach. The long-established principle of laundering practices is that a detergent suspends and floats off foreign substances. Through research, a way has been found to make the bactericides in a new soap compound cling to fabric, creating a long-lasting resistance to infection.

Second product is a specially-compounded detergent for protection of hard surfaces. It builds up a concentration of anti-bacterial substance on the areas that are washed. An additional feature is that wet-mopping activates anti-bacterial surfaces regularly scrubbed with this compound.

The third product is a soap, marketed through hospital and institutional channels, which builds up anti-bacterial action on the skin. This soap is available in bar and liquid form for patients and hospital personnel. A special formulation is designed for pre-operative scrub-up by surgeons.

# Mississippi Tests On a New Anthelmintic In Sheep

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Investigations of organic phosphorus compounds as insecticides for plants and animals have aroused interest in their use as anthelmintics for cattle and sheep. One compound, Bayer 21/199, was tested in sheep by Gordon.[1] This compound, which has the chemical formula of *0,0*-diethyl *0*-(3-chloro-4-methyl-7-coumarinyl) phosphorothioate, was found to be effective against *Haemonchus contortus, Oesophagostomum columbianum,* and *Trichostrongylus* spp. The high toxicity which caused deaths at the dosage levels of 5.5 mg./kg. and 7.3 mg./kg. was considered to preclude general usage of the drug as an anthelmintic.

Critical tests of Bayer 21/199 on sheep and cattle by Herlich and Porter[2] indicated that the drug was highly effective against gastrointestinal nematode parasites of these animals, including *Cooperia* spp., *Trichuris* spp., and *Strongyloides papillosus,* three relatively resistant to phenothiazine. The toxic effects of the drug in these tests were limited to transitory symptoms of poisoning including diarrhea, listlessness, inappetence, lacrimation, and salivation.

Galvin, Bell and Turk[4] found that a dosage level of 25 mg./kg. of Bayer 21/199 killed 12 out of 14 ewes treated with gelatin capsules containing the drug. No signs of intoxication were seen in four lambs treated at the dosage level of 12.5 mg./kg.

The results of this previous research and the economic problem of losses from parasitism of sheep in Mississippi made further field experimentation advisable. This report concerns tests conducted in Mississippi at State College, Brooksville, and Natchez.

## Procedure

Three separate tests were made using late lambs born in February and March of 1958. The tests at State College and Brooksville were run simultaneously, while the test at Natchez was carried out approximately one month later. Sixteen Montadale lambs were used at State College; 38 lambs resulting from crossbreeding Southdown rams with Western-type ewes were used at Brooksville, and 36 Suffolk X Hampshire lambs were used at Natchez. The preparation of Bayer 21/199 which was used throughout the tests was a water suspension of 25% wettable powder administered orally at the rate of 15 mg. of active material per kg. of body weight. No effort was made to effect closure of the esophageal groove. Care was taken to keep the suspension stirred to overcome the tendency of the material to settle out. After treatment the animals were retained for 24 to 36 hours in small pens to permit observations of any developing toxic effects.

This work was a cooperative project of the Animal Disease and Parasite Research Division, Agricultural Research Service, U. S. Department of Agriculture, and the Mississippi Agricultural Experiment Station. The authors' addresses: Robert A. Knight, Regional Animal Disease Research Laboratory Substation, State College, Miss.; John A. McGuire, Natchez Branch Experiment Station, Natchez, Miss.; and Louie Walton, Black Belt Branch Experiment Station, Brooksville, Miss.

The technics of Porter[4] and Herlich[5] were used for enumerating the worms present in the intestinal contents and the abomasal walls at necropsy. Fecal examinations were made by the direct centrifugal flotation technic with zinc sulfate as the flotation solution. All counts included total numbers with no attempt made to identify nematode species from the eggs.

## Experimental Data and Results

*Experiment 1.* At State College, 16 lambs, 150 days old, were pastured on a permanent Bermuda pasture upon which several head of cattle were also grazing. All lambs had been drenched with phenothiazine during May, approximately two months earlier. The lambs were divided into two groups of eight animals each — one for treatment and one for controls. July 17, 1958, the lambs were weighed and drenched with Bayer 21/199. Weights were recorded and fecal samples collected for egg counts on the treatment date and dates one week, two weeks, and four weeks post-treatment. Two weeks post-treatment, two lambs from each group were slaughtered for post-mortem examination.

Data relating to fecal egg counts, weight gains, and numbers and species of worms recovered are shown in Table 1. On the date of treatment, fecal samples were obtained from only two of the total 16 lambs. One had 2,800 e.p.g. (eggs per gm. of feces) and the other 680. Following the administration of the drug, the treated group and non-treated controls averaged about the same numbers of worms; however, the former group had a greater proportion of immature worms — mostly fourth-stage larvae in the stomach — than the latter group.

The lambs appeared to tolerate the drug well. The only indication of a toxic reaction was a slight diarrhea, which had disappeared at the end of 36 hours, when the animals were turned back onto pasture. At the time the animals exhibited the diarrhea, they were observed eating grass.

*Experiment 2.* At Brooksville, 38 February-March lambs approximately 150 days old, which had received no previous treatment for parasitism, were separated from their dams on July 31, 1958, the date the experiment began. They were pastured on Ladino clover and were replaced on it after treatment. The lambs were randomly split into two groups of 19 each by alternating between control and treatment as they were caught. Each lamb was weighed and drenched according to weight, if it was to be a treated individual. A fecal sample was collected for egg counts. At the end of one, two and four weeks, all lambs were weighed and fecal samples were collected for egg counts. The experiment was terminated at four weeks when the controls began dying, presumably from parasitism. None of the lambs was available for necropsy.

On the morning after treatment, six lambs in the treated group were found dead. One control died one week post-treatment while being moved from the pasture to the scales, and three more control lambs died approximately four weeks after treatment. Since no post-mortem examinations were made at Brooksville, the data consist of egg counts and weight gains which show that the treated group gave a better performance than the untreated group (Table 1).

*Experiment 3.* The test at Natchez used 36 lambs, 180 days old; 24 had been drenched with phenothiazine ten days prior to the Bayer treatment. The 12 remaining lambs had never received any anthelmintic treatment and were in extremely poor condition. One died during the time the others were being weighed and drenched. The lambs that had received the phenothiazine were somewhat stronger physically; however, they had been in a weakened state prior to the phenothiazine drenching, but their condition had improved afterwards when they were placed on a lush new pasture. The 36 lambs were split into equal groups, one for treatment, and one for control. Each group consisted of 12 phenothiazine treated lambs and six lambs that had had no prior treatment. The lambs were weighed, drenched, and fecal samples were collected on August 28, 1958. Weights and fecal samples were taken at one week and four weeks post-treatment.

On the day after treatment, two lambs that had been given Bayer 21/199 with no

prior treatment were found dead. Three weeks after treatment, four lambs in the control group died, presumably from parasitism. The average weight gains for the total groups were higher for the Bayer-drenched animals than for the controls. Table 1 contains data concerning egg counts, weights, and weight gains.

*Experiment 4.* An additional experiment was made to determine whether the increase in the egg count observed four weeks after treatment in experiments one and two was due to maturation of larvae present in the host at the time of treatment or to newly acquired worms picked up from the pasture. At the conclusion of experiment

**TABLE 1. Sheep Parasites: Results of Tests in Mississippi with Bayer 21/199**

STATE COLLEGE

| | Weeks After Start of Experiment | | | |
|---|---|---|---|---|
| | 0* | 1 | 2 | 4 |
| Treated: | | | | |
| E.p.g. (Av.)** | | 135 | 0 | 2,539 |
| Weights (Av. lbs.) | 38 | 38 | 43 | 51 |
| Weight gains (Av. lbs.) | | 0 | 5 | 13 |
| Controls: | | | | |
| E.p.g. (Av.) | | 352 | 225 | 2,701 |
| Weights (Av. lbs.) | 40 | 42 | 46 | 53 |
| Weight gains (Av. lbs.) | | 2 | 6 | 13 |

Worms Recovered at Necropsy

| | Adult Nematodes | | | | | | | Larvae | |
|---|---|---|---|---|---|---|---|---|---|
| Treated: | H.c. | O.c. | C.spp. | T.c. | Nem. spp. | S.p. | Intes-tine | Stomach | Total |
| L 253 | 12 | 40 | 0 | 80 | 40 | 1,600 | 840 | 5,460 | 8,084 |
| L 234 | 21 | 80 | 0 | 40 | 0 | 4,400 | 0 | 840 | 5,381 |
| Av. | 17 | 60 | 0 | 60 | 20 | 3,000 | 420 | 2,650 | 6,733 |
| Controls: | | | | | | | | | |
| L 256 | 554 | 40 | 840 | 200 | 200 | 1,280 | 0 | 1,120 | 4,263 |
| L 267 | 415 | 0 | 80 | 0 | 40 | 6,880 | 0 | 720 | 8,162 |
| Av. | 485 | 20 | 460 | 100 | 120 | 4,080 | 0 | 920 | 6,213 |

BROOKSVILLE

| | Weeks After Start of Experiment | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 4 |
| Treated: | | | | |
| E.p.g. (Av.)** | 669 | 6 | 77 | 1330 |
| Weights (Av. lbs.) | 56.7 | 56.2 | 56.7 | 62 |
| Weight gains (Av. lbs.) | | —0.5 | 0 | +5.3 |
| Controls: | | | | |
| E.p.g. (Av.) | 754 | 1614 | 3609 | 9091 |
| Weights (Av. lbs.) | 58.4 | 56.1 | 56.2 | 60 |
| Weight gains (Av. lbs.) | | —2.3 | —2.2 | +1.6 |

NATCHEZ

| | Weeks After Start of Experiment | | |
|---|---|---|---|
| | 0 | 1 | 4 |
| Treated: | | | |
| E.p.g. (Av.)** | 1109 | 10 | 24 |
| Weights (Av. lbs.) | 41 | 41.3 | 46.6 |
| Weight gains (Av. lbs.) | | 0.3 | 5.6 |
| Controls: | | | |
| E.p.g. (Av.) | 1231 | 88 | 1177 |
| Weights (Av. lbs.) | 47.4 | 45.4 | 50.6 |
| Weight gains (Av. lbs.) | | —2.0 | +3.2 |

H.c. = *Haemonchus contortus*
O.c. = *Ostertagia circumcincta*
C.spp = *Cooperia* spp.
T.c. = *Trichostrongylus colubriformis*
Nem. = *Nematodirus* spp.
S.p. = *Strongyloides papillosus*

* Date of treatment
** Eggs per gram of feces

one, the five lambs surviving were allowed to continue grazing for approximately 60 days on the same pasture until the parasite load had increased to a level as indicated by an average egg count of 460 e.p.g. On November 26, 1958, the five lambs were drenched with Bayer 21/199 and placed in a concrete-floored pen for two months while daily egg counts were made up to the first two weeks, and then semi-weekly.

After treatment the average egg count for the five animals dropped to approximately 25 e.p.g. and remained generally under 100 until the experiment was terminated with the slaughter of four lambs for necropsy. Very few worms were found upon postmortem examination; however, all four lambs carried some adult nematodes. Average numbers of worms for the four lambs were 105 *Ostertagia circumcincta*, 40 *Trichostrongylus axei*, 410 *T. colubriformis*, and 320 *S. papillosus*. Results here indicate that the increase in egg counts of animals in experiments one and two at four weeks resulted from maturation of larvae picked up from the pasture after treatment. A second treatment of Bayer 21/199 as an anthelmintic produced no apparent unfavorable effects or symptoms when administered after 12 weeks.

## Discussion

These tests indicate that Bayer 21/199 is an effective anthelmintic in controlling nematode parasitism in sheep. Egg counts of treated animals dropped to very low levels where they remained for nearly a month until a rapid increase brought the egg counts to levels comparable to those of the controls. The experiment with the five lambs on the concrete floor suggests that this increase resulted from new infections and that more frequent drenching is necessary to control parasitism in Mississippi sheep. The drug was effective against *H. contortus*, *Cooperia* spp., *T. colubriformis*, and *Nematodirus* spp., though of uncertain degree for the last two. Against *S. papillosus* the effectiveness was not as great, possibly due to reinfection, as that found by Herlich and Porter who reported nearly 100% effectiveness.[5] Greater weight gains were made by the treated groups. The degree of toxicity encountered was somewhere intermediate between that found by Herlich and Porter,[5] and Gordon.[1] Of the 45 animals treated with a single dose, eight deaths resulted. The few lambs receiving two drenchings with Bayer 21/199 showed no untoward symptoms as a result of the second treatment. Any noticeable symptoms were mild, transitory, and not enhanced by repeated treatments. A reduction in dosage levels may give a greater degree of safety to circumvent the high toxicity of the drug and still retain the broad range of effectiveness possessed by it. Much additional investigative work must be accomplished before the drug can be recommended as an anthelmintic in sheep.

## Summary

Three separate experiments involving 90 late lambs were conducted in Mississippi to test the anthelmintic effects of Bayer 21/199 on the gastrointestinal nematode parasites of sheep, and the toxic effects of the material on the animals when administered at the rate of 15 mg./kg. of body weight. Forty-five lambs were treated with the drug and eight died. Any toxic symptoms exhibited by the remaining animals were mild and consisted primarily of a slight diarrhea, which disappeared within 36 hours. A few animals received second doses of Bayer 21/199 at intervals of 12 weeks and showed no cumulative effects because of additional treatments. In all cases the surviving animals drenched with the Bayer preparation made better weight gains with a concurrent drop in egg counts.

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# Cystic Pituitary Glands in Cattle

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CYSTS HAVE BEEN OBSERVED in the pars distalis portion of the pituitary of man,[1] and have been produced experimentally in the pars distalis of dwarf mice according to Francis.[2] Ellison and Wolfe[4] observed fluid in the residual lumen in numerous castrate male rats.

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Madsen, *et al.*[5] found numerous cases of cystic pituitary glands in dairy cattle with vitamin A deficiency. These cysts were either in the residual lumen or the posterior lobe. Cystic pituitary glands have been reported by Fransen and Andrews[6] and Lindley[7] in dwarf Hereford cattle.

Delphia, *et al.*[3] reported certain abnormalities in the adrenal and pituitary glands of two sterile dwarf Hereford bulls: (1) the

TABLE 1

| No. | Type of Pedigree | Breed | Age (mo.) | Sex | Age at Castration (mo.) | Fluid in lumen | Enlarged lumen | Transitional material in nervosa |
|---|---|---|---|---|---|---|---|---|
| N365 | DC | Hereford | 19 | M | 3 | | | |
| N368 | DC | " | 18 | M | 3 | x | x | x |
| N376-2 | DC | " | 27 | M | 3 | | | |
| N376-3 | DC | " | 34 | F | | x | x | x |
| N376-4 | DC | " | 28 | M | 4 | | | |
| N376-5 | DC | " | 28 | F | | | | |
| N376-6 | DC | " | 27 | F | | | | |
| N376-7 | DC | " | 27 | M | 4 | | | |
| N376-8 | DC | " | 27 | M | 4 | | | |
| N440 | DC | " | 15 | M | 3 | | | |
| N445 | D | Shorthorn | 72 | F | | | | x |
| N446 | D | Angus | 2 | M | | | | x |
| N457-3 | D | Hereford | | M | | x | x | x |
| *N376-1 | D | " | 34 | M | 30 | | | x |
| *N376-9 | D | " | 46 | M | 42 | x | x | x |

Symbols: x—transitional material evident.
D—dwarf.
DC—dwarf-carrier.
*—data given in previous publication.

invasion of the pars nervosa by tissue from the pars intermedia; (2) a capsule-like separation of the remnants of the pars nervosa from the transitional tissue of the pars intermedia; (3) one case in which the residual lumen was filled with fluid causing an enlargement; and (4) nodular cortical hyperplasia in the capsules of the adrenal glands. Delphia, *et al.*,[3] in a study of dwarf, dwarf-carrier and non-dwarf cattle of varying age and four breeds, observed nodular cortical hyperplasia in the adrenal gland capsules. Most of the animals in the above group are involved in this study.

TABLE 2

| No. | Sex | Approx. Age by Study of Teeth (mo.) | Breed | Enlarged, fluid filled residual lumen |
|---|---|---|---|---|
| N481-14 | S | 18 | Hereford | |
| N481-15 | S | 20 | " | |
| N481-16 | S | 24 | " | x |
| N481-17 | S | 18 | Angus | |
| N481-18 | S | 18-24 | Hereford | |
| N481-19 | S | 18-24 | " | |
| N481-20 | S | 30 | " | x |
| N481-21 | S | 24 | " | |
| N481-22 | S | 24 | " | |
| N481-23 | S | 24 | " | |
| N481-24 | | 20 | " | |
| N481-25 | S | 20 | " | |
| N481-26 | S | 20 | " | |
| N481-27 | S | 20 | " | x |
| N481-28 | S | 20 | " | |
| N481-29 | S | 20 | " | |
| N481-30 | S | 18 | " | |
| N481-31 | S | 18 | " | |
| N481-32 | S | 20 | " | |
| N481-33 | S | 20 | " | |
| N481-34 | S | 20 | Shorthorn | |
| N481-35 | S | 20 | Hereford | |
| N481-36 | S | 20 | " | |
| N481-37 | S | 20 | " | |
| N481-38 | F | 22 | Shorthorn | |
| N481-39 | F | 20 | " | |
| N481-40 | F | 20 | " | |
| N481-42 | F | 18 | " | |
| N481-43 | F | 19 | " | |
| N481-44 | F | 17 | Hereford | |
| N481-45 | F | 19 | Shorthorn | |
| N481-46 | | 19 | Hereford | |
| N481-47 | S | 19 | " | |
| N481-48 | S | 19 | " | x |
| N481-49 | F | 42 | " | |
| N481-51 | F | 30-36 | " | |
| N481-52 | F | 30 | " | |

S—castrate male
F—female

## Materials and Methods

Pituitary glands of dwarf, dwarf-carrier and non-dwarf animals of varying ages from three beef and one dairy herd, obtained from purebred animals belonging to North Dakota Agricultural College were studied. At time of slaughter the pituitary gland was bisected and the right and left halves were placed in Lavdowsky's and Bouin's fluid respectively. Serial sections of six microns were prepared by way of the dioxan-paraffin method. Sections were stained with hematoxylin. Table 1 indicates the pedigree type, breed, sex, age, age of castration and the various abnormalities in the pituitary glands observed in the group of animals from N.D.A.C.

Pituitary glands from grade Hereford, Angus and Shorthorn cattle were collected at the time of slaughter at the Armour packing plant, West Fargo, North Dakota. Table 2 and Table 3 indicate the breed, age, sex, and presence or absence of a fluid filled residual lumen. Table 3 also indicates the pregnancy status of the females.

## Observations

Fluid in the residual lumen, extreme enlargement of the residual lumen, invasion of the pars nervosa by tissue from the pars intermedia and a capsule-like investment of the small remnant of the pars nervosa were found in the case of the dwarf Hereford bull N457-3.

The dwarf-carrier Hereford castrate male, N368, showed less distortion of the fluid-filled lumen than in N457-3, some invasion of the pars nervosa by tissue of the pars intermedia and slight evidence of the capsule-like investment of the pars nervosa remnants.

The dwarf Shorthorn cow N445 and the two month old dwarf Angus bull showed slight invasion of the pars nervosa by the tissue of the pars intermedia. N445 had reproduced three offspring, all of which died at birth. She failed to conceive during the last year.

Table 2 indicates that four castrate males

TABLE 3

| Number | Sex | Pregnancy Status | Approx. Age by Study of Teeth (mo.) | Breed | Enlarged, Fluid Filled Residual Lumen |
|---|---|---|---|---|---|
| N485-15 | F | Calved approx. 4 days | 18 | Hereford | |
| N485-21 | F | Preg. approx. 6 mo. | 30 | " | x |
| N485-22 | F | | 30 | " | x |
| N485-23 | F | | 30 | " | |
| N485-24 | F | | 30 | " | x |
| N485-34 | F | Preg. approx. 2 mo. | 24 | " | x |
| N485-35 | F | | 24 | " | |
| N485-36 | F | | 30 | " | |
| N485-38 | F | | 18 | " | |
| N485-39 | F | | 18 | " | |
| N485-40 | F | | 18 | " | |
| N485-43 | F | | 18 | " | |
| N485-48 | S | | 18 | " | |
| N485-49 | S | | 12 | Shorthorn | |
| N485-50 | S | | 18 | Hereford | |
| N485-51 | S | | 12 | Shorthorn | x |
| N485-54 | F | Preg. approx. 3 mo. | 18 | Angus | |
| N485-56 | F | | 24 | Hereford | |
| N485-58 | F | Preg. approx. 8 mo. | 30 | " | x |
| N485-59 | F | Preg. approx. 8 mo. | 30 | " | x |

S—castrate male
F—female

showed a fluid-filled residual lumen while none of the females in this group of grade animals showed this condition. The data in Table 3 indicate that one castrate male, four pregnant females and two non-pregnant females showed the fluid-filled residual lumen. The date of castration for the males from Armour packing plant is not known.

## Discussion and Summary

Fluid in and enlargement of the residual lumen was observed in the castrate dwarf Hereford male N376-9.[8] This was also observed in the dwarf-carrier Hereford castrate male N368. The existence of the fluid in the lumen in the fertile dwarf Hereford bull N457-3 and the dwarf-carrier Hereford female N376-3 indicates that a factor other than castration can cause this anomaly. There was no history of a vitamin A deficiency in any of the purebred animals used in this study. The history of the feeding of the grade animals is unknown.

It is noted that invasion of the pars nervosa by tissue of the pars intermedia existed in the dwarf Hereford bull N376-6,[8] the dwarf Shorthorn cow N445 and the dwarf Angus bull calf N446 without the presence of fluid in or the enlargement of the lumen.

Examination of the data indicates that a fluid filled residual lumen is not limited to sex, castration, age, pregnancy status, beef breed or dwarfism.

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# Evaluation of Water Soluble Nitrofurans in Experimental Salmonella Infection in Turkey Poults

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For many years, pullorum disease and fowl typhoid have been diseases of economic importance in the poultry industry and until the present decade no satisfactory treatment was available.

In 1953, the synthetic nitrofuran, furazolidone† (Furoxone®, Eaton) was reported effective *in vitro* against common Salmonella species at concentrations of 0.2 to 5.5 mcg./ml.[1] In contrast with sulfonamides and antibiotics, this nitrofuran was found bactericidal at these low levels.[2] Studies with 0.02 to 0.04 percent of the drug in the feed of chickens infected with S. *pullorum*,[3,4] S. *gallinarum*,[5,6] and S. *typhimurium*[4] indicate that this drug can reduce the severity of the infection, mortality rate and the appearance of the carrier state. Similar favorable results have been reported in turkeys infected with S. *gallinarum*[6,7] and S. *typhimurium*.[8,9,10]

Furazolidone is relatively insoluble and thus can be used in the feed or in tablet form but not in drinking water. However, a water-soluble preparation of nitrofurazone* (Furacin®, Eaton) is used presently in drinking water for the treatment of chicken's coccidiosis and salmonellosis and swine enteritis.[11,12]

The need for a water-soluble nitrofuran effective against Salmonella infections has long been felt by veterinarians. Treatment with medicated water can be given easily, with the advantage that even flocks unable or unwilling to take feed may continue to consume water. Bulk feeding makes immediate feed medication impractical. A drug of this nature must have two outstanding qualifications: stability and solubility in water, and equal or superior effectiveness to furazolidone, both therapeutically and prophylactically.

The present study was undertaken to evaluate the therapeutic and prophylactic effects of a water-soluble preparation of nitrofurazone (Furacin® Water Mix Veterinary) and two experimental water-soluble

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nitrofurans: NF-248, an experimental nitrofuran, and furaltadone (Altafur T.M.) in drinking water, compared to the control drug furazolidone administered in the feed. All these drugs were used singly against S. *typhimurium*, S. *heidelberg* and S. *gallinarum* experimental infection in turkey poults.

## Material and Methods

Three similar experiments were conducted (tables 1, 2 and 3) using a total of 508 one-day-old poults. Infected birds were separated from those noninfected, but maintained under identical conditions. Blood tests, bacterial cultures, necropsy and bacteriologic findings, body weights and feed conversion were recorded individually. Poults were obtained from a source with no history of salmonellosis.

Experiment 1 (table 1) using S. *typhimurium*, included a total of 100 birds and was designed to study the prophylactic value of these nitrofurans and the carrier states of survivors at eight weeks of age. Medication was started when birds were received (one day old) and was continued until the 14th day. Further details on the experimental design are outlined in Table 1.

**TABLE 1. Prophylactic Efficacy in S. typhimurium Infected Poults***

| Groups | No. Birds | Deaths within 10th day No. | Deaths within 10th day Percent |
|---|---|---|---|
| Infected Medicated** | | | |
| furazolidone, 0.022% in feed | 20 | 0 | 0 |
| NF-248, 0.0066% in water | 20 | 4 | 20 |
| furaltadone, 0.0264% in water | 20 | 0 | 0 |
| Infected Nonmedicated | 20 | 11 | 55 |
| Noninfected Nonmedicated | 20 | 0 | 0 |
| Total | 100 | | |

*infected *per os* at 1 day (24 hr.) of age.
**medication started on 1st day and continued through 14th day.

Experiments 2 and 3 (tables 2 and 3) using S. *heidelberg* and S. *gallinarum* were short-term experiments that included a total of 112 (Exp. 2) and 120 (Exp. 3) birds, and were designed to determine both therapeutic and prophylactic values of the drugs and their immediate effect on gross lesions on necropsy at ten days of age. Prophylactic medication was started when birds were received (one day old), whereas therapeutic medication was not started until conclusive clinical evidence of illness was observed, such as chills, soiled vents or dying birds. Further details on experimental designs are given in tables 2 and 3.

In each experiment, both therapeutically and prophylactically medicated birds were placed in three groups: one on 0.022 percent furazolidone in feed, another on 0.0066 percent (0.25 gm./gal.) soluble NF-248 in drinking water and a third one on 0.0264 percent (1 gm./gal.) soluble furaltadone in drinking water. The two control groups consisted of infected nonmedicated and noninfected nonmedicated groups.

All birds were placed on a complete basal ration containing no antibiotics. Where feed medicated with furazolidone was used, the drug concentration was confirmed by chemical assay. Medicated water was provided in waterers with standard metal bases and gallon glass jars. The solutions were changed on the fourth, sixth and eighth days or as needed in the prophylactic experiments, and on the sixth and eighth days in the therapeutic experiments.

Criteria of infection were based on clinical signs of illness, presence of typical cecal plugs or other lesions, and isolation of salmonellae from tissues.

Salmonella identification criteria were positive reactions on triple-sugar iron agar slants; typical sugar reactions: dextrose, lactose, maltose, sucrose, mannitol and salicin, and Christiansen's urea broth; and typical agglutination reactions with somatic and flagellar antisera. Prior to use, the identity of the pathogen was confirmed by an official Salmonella typing center.

The virulence of the three Salmonella strains used had been previously enhanced by recent passage through a homologous host, and the infecting dose determined by preliminary trials. Standardization of bacterial dosages was accomplished in all experiments by means of a Bausch and Lomb Spectronic 20 optical density apparatus.

In Experiment 1, blood tests were done at four and eight weeks of age. At necropsy (eight weeks of age) the following tissues were examined bacteriologically: proventriculus, duodenum, cecal tonsils, heart sac, lung-air sac, liver-spleen-gallbladder, and sexual organs. Cloacal swabs were obtained immediately prior to exposure and two weeks thereafter. Daily records of water consumption were kept. In experiments 2 and 3, routine bacteriologic methods were employed.

## Results and Discussion

Effectiveness of feed medicated with furazolidone and water medicated with either NF-248 or furaltadone was demonstrated, both prophylactically (Exp. 1, 2 and 3) and therapeutically (Exp. 2 and 3).

Mortality from the infection was consistently lower, both in the prophylactic and therapeutic groups, in medicated birds as compared to the control nonmedicated groups. (Exp. 1, 2 and 3).

In experiment 3 (table 3), water-soluble nitrofurazone showed surprising prophylactic effectiveness in 20 poults infected with S. *gallinarum*. Results with this nitrofuran were especially noteworthy when one considers the fact that 100 percent of the infected nonmedicated birds died, and the drug dosage used was only one-half that used for coccidiosis in chickens.

In S. *typhimurium* infection (table 1) soiled vents were observed in 50 percent or less of all medicated birds as compared to 90 percent of the control birds.

The problem of water consumption was given special attention. There was no evidence that the medication of the water interfered with water intake. In fact, nonmedicated birds experienced a sharp decline in water intake during the third to sixth days post infection. In all nitrofuran-treated birds, the water intake appeared to be maintained by the medication.

A similar pattern occurred with reference to feed consumption. In the therapeutic experiments, all of the nitrofurans tested promoted weight gains, as compared to those of infected nonmedicated control birds, and body weights of medicated birds were comparable to those of the noninfected nonmedicated controls. In the prophylactic experiments, average body weights of medicated birds were higher than those of the noninfected nonmedicated controls.

Blood tests confirmed findings previously reported.[10] At four weeks of age, two poults not positive to any serologic test were carriers, since S. *typhimurium* was isolated on bacteriologic examination of cloacal swabs.

**TABLE 2. Efficacy in S. heidelberg Infected Poults***

| Groups | Therapeutic Expt.** No. birds | Deaths within 10th day No. | Deaths within 10th day Percent | Prophylactic Expt.*** No. birds | Deaths within 10th day No. | Deaths within 10th day Percent |
|---|---|---|---|---|---|---|
| Infected Medicated | | | | | | |
| furazolidone, 0.022% in feed | 17 | 9 | 52 | 20 | 7 | 35 |
| NF-248, 0.0066% in water | 16 | 5 | 33 | 20 | 3 | 15 |
| furaltadone, 0.0264% in water | 19 | 5 | 26 | 20 | 6 | 30 |
| Infected Nonmedicated | 17 | 8 | 47 | 20 | 9 | 45 |
| Noninfected Nonmedicated**** | 19 | 3 | 15 | 20 | 3 | 15 |
| Totals | 88 | | | 100 | | |

*infected *per os* at 4 hours of age.

**therapeutic medication started at 40 hours of age and continued to the 10th day.

***prophylactic medication started at 4 hours of age and continued to the 10th day.

****deaths in the noninfected, nonmedicated groups attributed to starvation.

In all nitrofuran-medicated poults there was suppression of serologic titers. At eight weeks of age, four poults in each medicated group failed to react to any serologic test but were found to be carriers by bacteriologic examination. In all medicated groups, blood titers were significantly below that of infected nonmedicated controls.

Cloacal swabs made when the birds were one day of age were negative. Subsequently, the percentage of birds yielding cloacal swabs positive to S. *typhimurium* (Exp. 1) was lower in all medicated groups than in infected nonmedicated controls. At eight weeks of age, positive swabs in the medicated birds ranged from 0 to 33 percent and from 50 to 60 percent in the infected nonmedicated control groups.

Experimental results with S. *heidelberg* (Exp. 2) were enlightening, despite some difficulties, such as birds dying from starvation (so-called "starveouts"), poor quality poults, and the occurrence of a hurricane. Poults under these conditions frequently present on necropsy even after the sixth or seventh day, unabsorbed yolk, ordinarily absent in normal poults. The percentage of birds with unabsorbed yolks on the tenth day was lower in the medicated groups than in the infected nonmedicated control birds, and it was either lower or compared favorably to that of the noninfected nonmedicated controls.

## Summary and Conclusions

Furazolidone 0.022 percent in feed; solubilized NF-248, 0.0066 percent in drinking water; or solubilized furaltadone, 0.0264 percent in drinking water, prophylactically, for the first 14 days of life, drastically reduced mortality from experimentally induced S. *typhimurium* infection in poults, as compared to infected nonmedicated control birds.

These nitrofurans reduced the percentage of soiled and pasted vents, a common sign of S. *typhimurium* infection 14 days postexposure.

The nitrofurans promoted weight gains of birds as compared to those of infected nonmedicated controls and body weights comparable to those of the noninfected nonmedicated birds.

The proventriculus and cecal tonsil-rectum were the areas most frequently infected in the carrier state.

Neither the rapid whole-blood test, the rapid serum test, nor a somatic and flagellar antigen tube test were completely successful in detecting Salmonella infection in birds

**TABLE 3. Efficacy in S. gallinarum Infected Poults***

| Groups | Therapeutic Expt.** No. birds | Deaths within 10th day No. | Deaths within 10th day Percent | Prophylactic Expt.*** No. birds | Deaths within 10th day No. | Deaths within 10th day Percent |
|---|---|---|---|---|---|---|
| Infected Medicated | | | | | | |
| furazolidone, 0.022% in feed | 20 | 7 | 35 | 20 | 0 | 0 |
| NF-248, 0.0066% in water | 20 | 13 | 65 | 20 | 1 | 5 |
| furaltadone, 0.0264% in water | 20 | 8 | 40 | 20 | 0 | 0 |
| nitrofurazone, 0.004% in water | — | — | — | 20 | 2 | 10 |
| Infected Nonmedicated | 20 | 20 | 100 | 20 | 20 | 100 |
| Noninfected Nonmedicated | 20 | 0 | 0 | 20 | 0 | 0 |
| Totals | 100 | | | 100 | | |

*Infected *per os* at 1 day of age.

**therapeutic medication started at 4 days of age and continued to the 10th day.

***prophylactic medication started at 20 hours of age and continued to the 10th day.

bacteriologically demonstrated to be carriers. Tests made at four and eight weeks of age showed that serum titers were depressed in all medicated birds as compared to those of infected nonmedicated birds at similar ages.

The nitrofurans tested were effective in reducing the number of S. *typhimurium* intestinal carriers, compared to infected nonmedicated control birds. Upon post-experiment necropsy there were fewer S. *typhimurium* isolations in the medicated group.

The administration of furaltadone and NF-248 in drinking water did not interfere with water consumption.

Solubilized furaltadone and NF-248 in drinking water at same concentrations, as mentioned above, were effective prophylactically and therapeutically, since they prevented morbidity and reduced mortality in poults experimentally infected with S. *heidelberg*.

Furazolidone in feed also proved effective prophylactically in preventing this salmonellosis.

In the infected nonmedicated controls, there was a mortality of 45 percent, both in the therapeutic and prophylactic experiments, as opposed to a mortality rate of 25 percent of birds under prophylactic medication and 32 percent of those under therapeutic medication.

Solubilized furaltadone and NF-248 in drinking water and furazolidone in feed, at the concentrations mentioned above, were consistently effective both prophylactically and therapeutically.

Medication with furaltadone in drinking water and furazolidone in feed proved apparently superior to NF-248 in drinking water from both prophylactic and therapeutic standpoints.

Nitrofurazone in drinking water to provide 0.004 percent of the drug was effective prophylactically and compared favorably with furazolidone-medicated feed. This level is half that used for coccidiosis in chickens.

There was no evidence of instability in either solubilized nitrofurazone, furaltadone or NF-248 when the medicated drinking water was not changed for four days.

All of 20 infected nonmedicated control birds died, as opposed to a mortality rate of two percent of birds under prophylactic medication and 47 percent of those under therapeutic medication.

Under the conditions of the experiments nitrofurazone was a beneficial prophylactic agent against fowl typhoid used at half the level used for coccidiosis in chickens. Solubilized furaltadone and NF-248 were active both prophylactically and therapeutically against S. *typhimurium*, S. *heidelberg*, and S. *gallinarum*, but only solubilized furaltadone was equal to furazolidone in effectiveness.

Solubilized furaltadone would have been the nitrofuran of choice if it was not feasible or desirable to medicate through the feed.

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# Reader's Service

**This department will announce new therapeutic items, equipment, services, and literature of interest to veterinarians. All claims made are those of the firms concerned. Send communications to the address noted in copy.**

TALK-A-PHONE Chief Redi-Power, a new all-transistorized model designed to overcome high noise levels and provide complete intercommunication was introduced recently by Talk-A-Phone Co., 5013 N. Kedzie Ave., Chicago.

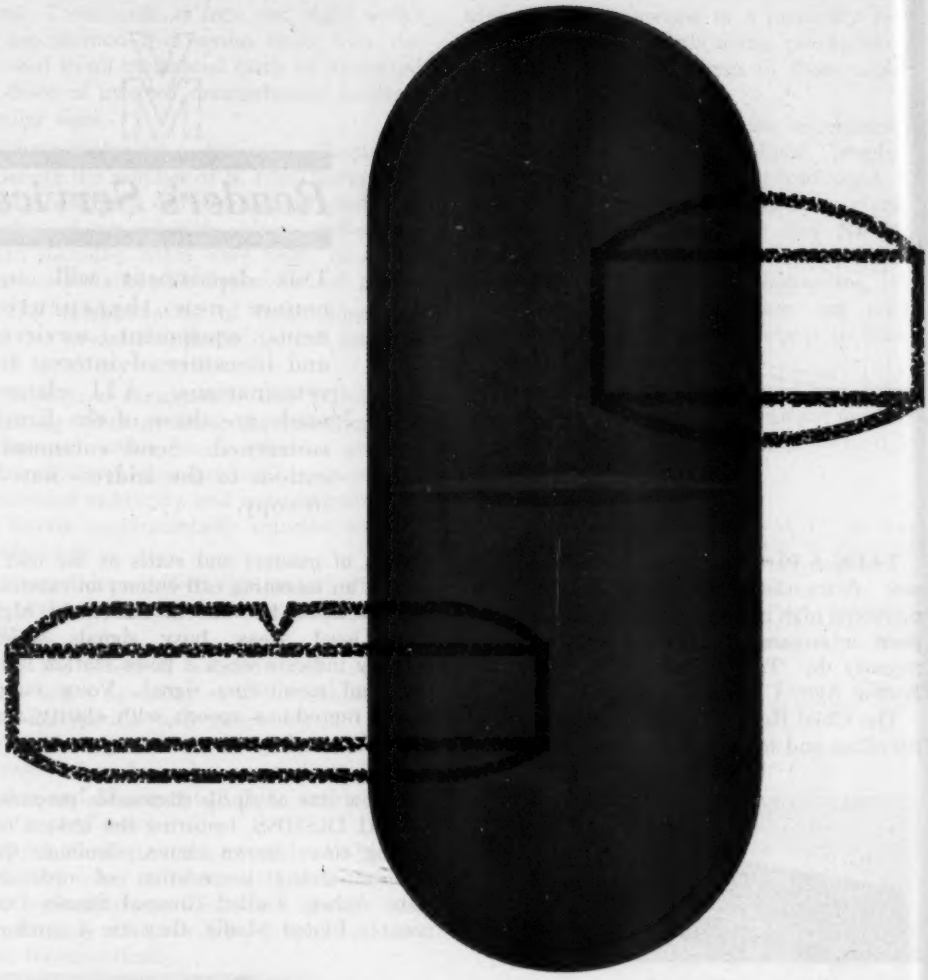
The Chief Redi-Power is designed to fulfill office and industrial intercom needs.

The versatile, new all-purpose unit, a compact, attractively housed model that is proportioned like a book, is less than three inches high and lies flat on a desk. It is self-compensating to deliver up to a full 20 watts of power to all or any group of stations, supplying ample volume to each station when called simultaneously, as well as individually. Each station receives its pre-determined amount of volume with no division of output as more stations are called at once. Return speech from called stations is received at normal room volume.

Standard features of the new Chief Redi-Power include private or non-private operation of masters and staffs at the user's choice; an incoming call chime; an external relay control for use in extremely high noise level areas; busy signals which visually indicate when a given station is in use; and monitoring signal. Voice range power reproduces speech with clarity and naturalness of tone.

A new line of sterile disposable prepared PETRI DISHES, featuring the unique resealing cover shown above, eliminate the time-consuming preparation of ordinary Petri dishes. Called Rimseal Sterile Disposable Plated Media, they are a product

of Baltimore Biological Laboratory, Inc., a division of Becton, Dickinson and Company. Plates can be opened and closed repeatedly for examination of cultures; a wide range of media is available.



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# Dioleen SUSPENSION AND CREAM

TRADEMARK (DIIODOHYDROXYQUIN, ABBOTT)

**From Abbott Laboratories... a highly effective new treatment for common small and large animal skin conditions.**

**What is Dioleen Suspension?**
Dioleen is a suspension of 5% w/v diiodohydroxyquin, U.S.P., in an aqueous base, with a detergent to facilitate lathering and rinsing. It is *non-toxic*, scented with lavender, and easy-to-use.

**What are the indications for Dioleen Suspension?**
Dioleen Suspension is indicated for the treatment of contact and allergic dermatitis, nonspecific dermatitis, hot spots, fungus infections, and as an aid in the removal of ectoparasites.

**How effective is Dioleen Suspension?**
Reports from clinical investigators indicate Dioleen provided effective control in upwards of 90% of the animals treated for allergic dermatitis, fungus and hot-spots, moist and summer eczema . . . usually in only one or two applications.

Marked improvement was noted after two or three treatments in patients suffering from infestations of fleas, lice, and mange mites.

Dioleen is often effective where other products have not succeeded. Investigators reported no case of sensitivity.

## DIOLEEN CREAM

**What is Dioleen Cream?**
Dioleen cream contains 5% w/w diiodohydroxyquin, U.S.P., in a water miscible, greaseless vanishing cream base. It is lightly scented and light tan in color. It is designed for "spot" or local application to severely affected skin areas in large and small animals. May be used concurrently with Dioleen Suspension therapy.

**How effective is Dioleen Cream?**
Clinical reports indicated favorable control of fungus-like infections, allergic dermatitis, hot spots, recurrent dermatitis, and flea bites in at least 80% of the cases studied. Results are usually seen in one to three applications. No side effects have been noted in clinical trials.

**Dioleen Cream for Large Animals**
In diverse large animal skin conditions—ringworm, eczema, and lesions resulting from cow-pox, chapped teats, and soreness at the base of the udder—Dioleen cream brought all cases studied under control in one or two applications.

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Dioleen Cream—In 1 oz. tubes and 1 pound jars. List No. 8702
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# Veterinary Calendar

Oct. 6-7. **University of Illinois,** 41st Annual Conference and Extension Short Course for Veterinarians. College of Veterinary Medicine, Urbana, Illinois. L. E. Boley, chairman.

Oct. 12-14. **Purdue University,** 48th annual conference. School of Veterinary Medicine, Lafayette, Indiana. Erskine V. Morse, Dean.

Oct. 13-14. **Eastern Iowa Veterinary Association,** 47th Annual Meeting. Hotel Montrose, Cedar Rapids, Iowa. Grant B. Munger, D.V.M., Secretary, 1921 First Avenue, S.E., Cedar Rapids, Iowa.

Oct. 16-19. **New England Veterinary Medical Association,** 26th Annual Meeting. Sheraton Biltmore Hotel, Providence, Rhode Island. Warren J. Comstock, D.V.M., Clayville, Rhode Island.

Oct. 23-26. **The Southern Veterinary Medical Association,** annual meeting. Francis Marion Hotel, Charleston, S. C. Otto M. Storck, D.V.M., General Chairman, 461 Maybank Highway, Charleston, S. C.

Oct. 26-28. **American Care Panel,** 11th annual meeting. Sheraton Jefferson Hotel, St. Louis, Missouri. Dr. Robert J. Flynn, secretary, Box 299, Lemont, Illinois.

Oct. 31, Nov. 1-2. **Association of Military Surgeons of the United States,** 67th annual convention. Mayflower Hotel, Washington, D. C. Rear Adm. Curtiss W. Schantz, general chairman, Asst. Chief of Bureau of Medicine & Surgery for Dentistry, Navy Department, Washington 25, D. C.

Nov. 7-8. **Missouri Veterinary Conference,** 36th annual. Columbia, Missouri. Cecil Elder, chairman.

Nov. 13-15. **Arizona Veterinary Medical Association,** annual meeting. Safari Hotel, Scottsdale, Arizona. Dr. Elmer B. Powell, 1102 S. Scottsdale Road, Scottsdale, Arizona.

Dec. 7-9. **Nebraska Veterinary Medical Association,** annual meeting. Hotel Cornhusker, Lincoln, Nebraska. Bob Garey, secretary.

Jan. 15-17. **Kansas Veterinary Medical Association,** 57th annual convention. Broadview Hotel, Wichita, Kansas. Dr. M. W. Osburn, secretary, 1525 Humboldt, Manhattan, Kansas.

Jan. 18-20. **Michigan State University,** 38th annual Postgraduate Conference for Veterinarians. Michigan State University, College of Veterinary Medicine, East Lansing, Michigan. M. W. Armistead, Dean.

Jan. 23-25. **Minnesota Veterinary Medical Association,** annual meeting. Leamington Hotel, Minneapolis, Minnesota. B. S. Pomeroy, secretary-treasurer, 1443 Raymond Ave., St. Paul 8, Minn.

Feb. 19-21. **Missouri Veterinary Medical Association,** 69th annual meeting. Hotel Statler-Hilton, St. Louis. Paul L. Spencer, secretary, P. O. Box 283, Jefferson City, Mo.

## Porter Named to Post At Norwich Pharmacal

David B. Porter, D.V.M., has been appointed director of veterinary clinical research for the newly established international section of the division of veterinary medicine of the Norwich Pharmacal Company, Dr. Harold Roberts, division director, has announced.

Dr. Porter's responsibilities will include development and supervision of clinical research, particularly with the company's nitrofuran drugs, by veterinary scientists at veterinary and agricultural schools, research institutes and farms in the many foreign countries where these drugs are widely used. The nitrofurans are distributed in this country through the Eaton Laboratories Sales Division and overseas by the Norwich Pharmacal Company's International Sales Division.


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## KSU to Improve Research Facilities

A legislative appropriation of $53,000, plus a grant of $47,000 from the National Institutes of Health, is enabling Kansas State University's School of Veterinary Medicine to greatly improve its facilities for animal disease research and teaching.

This $100,000 remodeling project of the old veterinary hospital, renamed "Burt Hall," should be completed by the end of the summer.

The completed project is providing modern facilities for animal disease research and specifically in the area of animal and poultry viruses.

Nine isolation units have been constructed with airtight doors and sterile compartments where researchers will change clothes before entering the rooms where animals are confined. Each unit has individual air flow filters, and temperature and humidity controls. Only the attendant and the research worker in charge will be allowed to enter these rooms for the duration of a particular project.

The first floor of Burt Hall has been remodeled to house the department of physiology and pharmacology and will include facilities for classroom and laboratory instruction and research in animal physiology and pharmacology.

## Knudson Appointed To USDA Post

Appointment of Dr. Robert L. Knudson as Assistant Director (Field Direction) of the USDA's Animal Disease Eradication Division effective August 16, 1959, is announced by Dr. R. J. Anderson, Director of the Animal Disease Eradication Division, USDA, Washington, D. C.

Dr. Knudson was formerly veterinarian in charge of Animal Disease Eradication activities for the Department in Columbus, Ohio, a post he had held since October 31, 1948.

## Fifth Regional Nitrofuran Conference In Indianapolis November 16

The fifth Regional Conference on the Nitrofurans in Veterinary Medicine will be held November 16, 1960 at the Sheraton-Lincoln Hotel in Indianapolis under the co-auspices of the Central Indiana Veterinary Medical Association and Eaton Laboratories, Division of The Norwich Pharmacal Company.

This practice oriented meeting features an audience participation diagnostic session in both large and small animal problems. This section of the program will be headed by pathologists David Coffin, V.M.D. and Russell Jones, D.V.M., teamed with clinicians Peter Johnson, D.V.M. and Fred A. Hall, D.V.M.

Large animal papers feature Beef Cattle Problems, Bovine Mastitis Control, Eperythrozoonosis of Swine, and Swine Enteritides.

Small animal sessions will feature Clinical Aspects of Canine Respiratory Infections, New Developments in Small Animal Surgery, Equine Practice, and Canine Enteritides.

Panel Discussions on both large and small animal subjects plus a luncheon presentation on Veterinary Economics make this a fact-filled program with speakers from all sections of the country and Canada. All veterinarians are welcome.

## Public Health Veterinarians To Meet in San Francisco

The Conference of Public Health Veterinarians will hold its 1960 scientific sessions, and a Dinner Session and Business Meeting, in conjunction with the Annual Meeting of the American Public Health Association in San Francisco.

The Conference sessions will extend from October 30 through November 3. Dr. Robert K. Anderson, President, urges all veterinarians interested in public health to attend the complete Conference program and, also, other sessions of the APHA Meeting.

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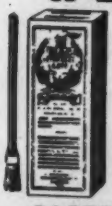
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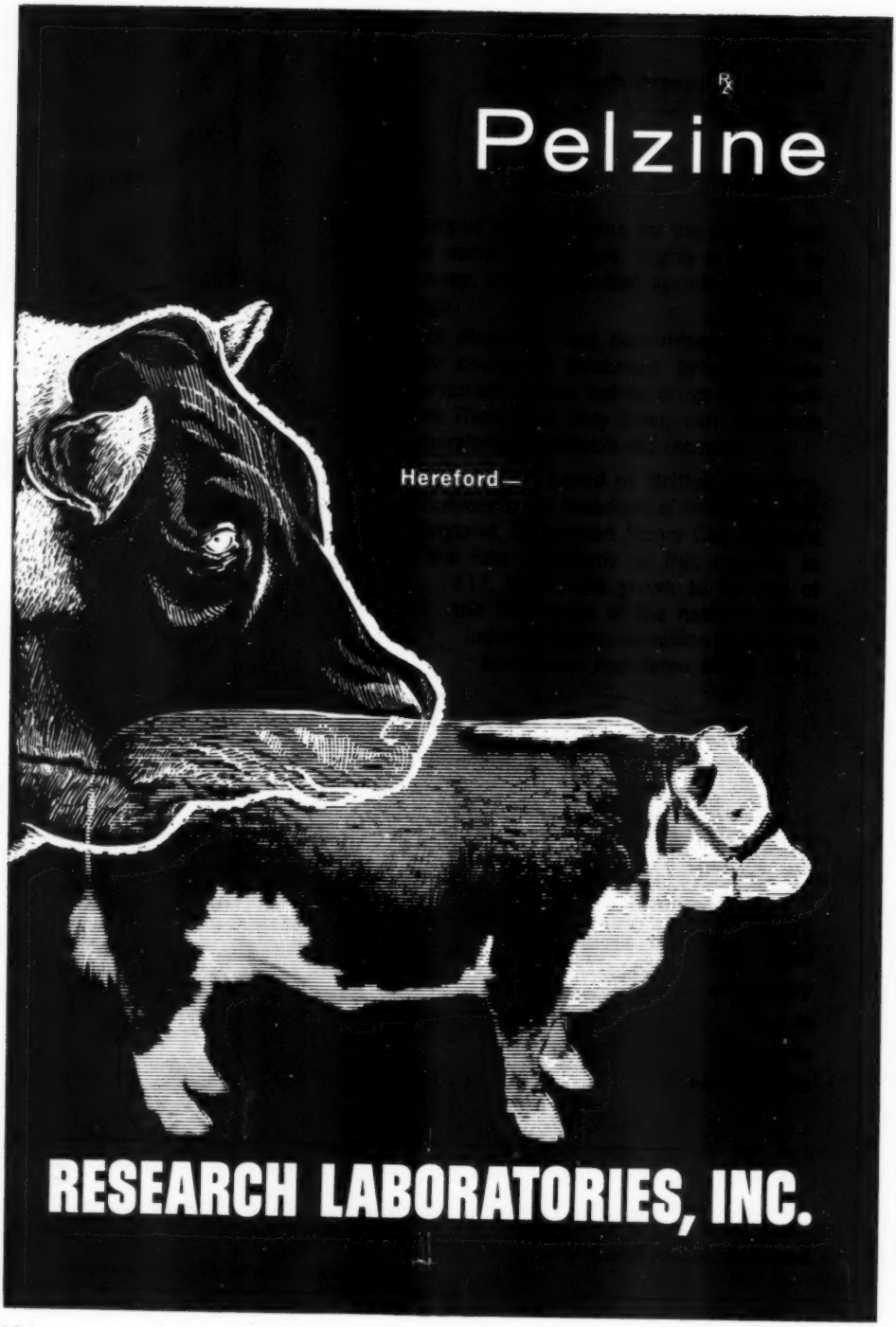
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## Squibb Appoints Christofferson to Staff

Dr. Paul V. Christofferson has been appointed to the position of assistant medical director, E. R. Squibb & Sons.

Dr. Christofferson received his D.V.M. degree from Colorado State University. He is known internationally for his research and reports on fluorosis in livestock. He has collaborated with the College of Dentistry at the University of Illinois in research on tooth development in cattle.

## New Department Established at Cornell

Cornell University has announced the establishment of a new Department of Physical Biology to study the fate of radioactive metals in the body and their influence on normal body metabolism. Cyril L. Comar, internationally known authority on biological problems resulting from atomic radiation, has been named head of the department. Thirty-four professors and researchers at Cornell will make up the staff.

The new department will be part of Cornell's New York State Veterinary College. It is believed to be the first department of its kind in any veterinary college. Special emphasis in the department's work will be on the disease problems associated with radioactive fallout.


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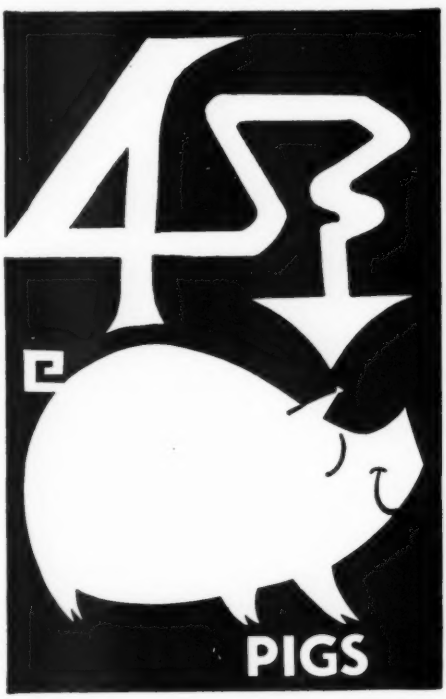


## Research Reveals Highly Effective Anthelmintic for Cattle

The results of recently intensive clinical research revealed an anthelmintic that is highly effective in cattle. Individual animals were confined in special stalls and administered different phenothiazine drench formulations for testing. All urinary and fecal excreta were recovered and each excretion was individually analyzed chemically to determine how much of the dose went into the digestive tract and amount of the dose available for killing worms. Dosages were given on an identical basis.

**Greater Concentration**

Results obtained from the modified formulation were better than that of unmodified drenches generally used. Tests show that modified formulations made with Purified phenothiazine, micronized for maximum efficiency, produced 6 to 8 times more phenothiazine in the digestive tract in a shorter period of time than other drenches. Peak percentages of the purified chemical were obtained in 17 hours post treatment. The unmodified formulations returned a peak percentage of less than .2% 40 hours or later post treatment.

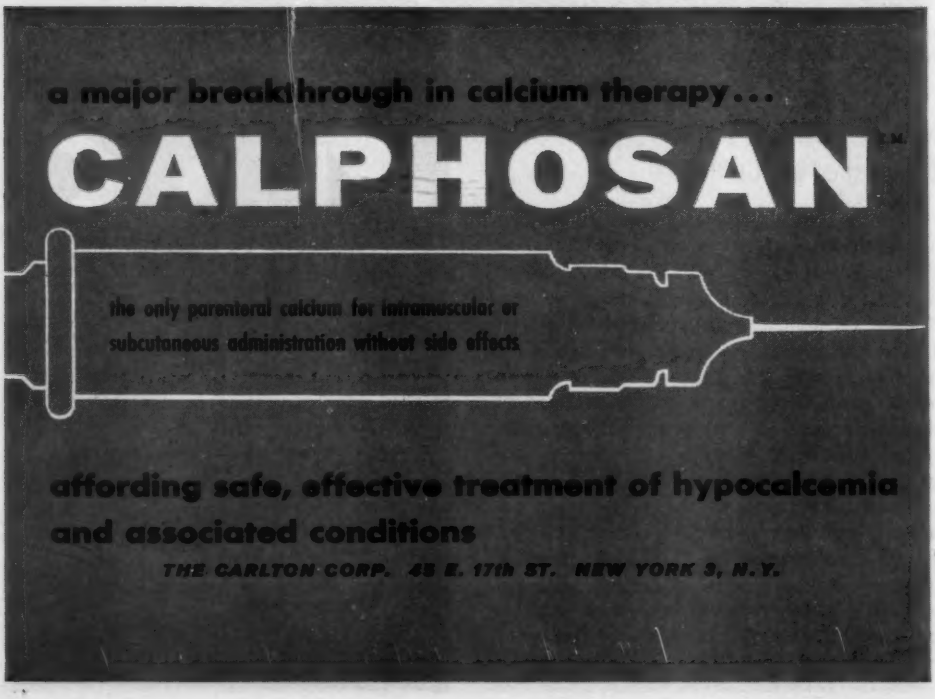
Other effective products are Pro-Brand Kabtin, a non-toxic demulcent for control of diarrhea from dietary or simple digestive causes; Pro-Brand KZ, antiseptic fungicide for ringworms and mycotic dermatoses; Pro-Brand Chap-Et a protective ointment for udders to reduce swelling and soreness. For details write to Pro-Brand Products Company, P. O. Box 4186, Fort Worth, Texas.

## USDA Appoints Dr. Pals

Dr. Pals

The appointment of Dr. Clarence H. Pals as director of the Meat Inspection Division in the Agricultural Research Service of the U. S. Department of Agriculture became effective September 1.

Dr. Pals succeeds Dr. Albert R. Miller, who is retiring after a distinguished career embracing almost 35 years of service in the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Department. The standards of this Service, which observed its Golden Anniversary in 1956, have set a pattern for the entire world.

Dr. Pals joined USDA in November, 1932 as a veterinary meat inspector. He came to Washington in June, 1944 as assistant to the chief of Meat Inspection Service in the former Bureau of Animal Husbandry, and in November of the same year was named chief of the trade label and standardization section.

## Moore Heads Knoll's Veterinary Division

Knoll Pharmaceutical Company, Orange, N. J., one of the first of manufacturers of ethical human pharmaceuticals to make their drugs available to veterinarians, has established a Veterinary Division, of which Angus Moore is director.

Creation of this division became necessary because of increasingly large use of Knoll drugs by veterinarians and by adoption of plans for increased participation in the field of veterinary therapy. Two new drugs will be announced in the near future, with others to follow. Formulas of several existing drugs will be adjusted to exactly meet the requirements of veterinary clinicians. All Knoll veterinary drugs are to bear distinctive veterinary labels and will be available only to licensed veterinarians. Distribution to practitioners will be through ethical veterinary distributors.

## Stafseth Selected As Fulbright Lecturer

Dr. Henrik J. Stafseth, Michigan State University, has been selected by the U. S. State department to be a Fulbright lecturer at the University of Utrecht, Holland, for the 1960-61 school year.

Dr. Stafseth, director emeritus of the division of biological science and professor emeritus of microbiology and public health, has been an internationally known scientist and veterinarian for many years. At Utrecht, he will lecture on poultry diseases and other areas in microbiology and immunology.

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